
THE ROYAL ASTRONOMICAL SOCIETY OF CANADA
LA SOCIÉTÉ ROYALE D'ASTRONOMIE DU CANADA



ANNUAL REPORT
RAPPORT ANNUEL

2021

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ROYAL ASTRONOMICAL SOCIETY OF CANADA—2022

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Observer's Calendar Editor

2022 Committees

Astroimaging

Awards

Constitution

Editorial Board

Education and Public Outreach

Finance

History

Inclusivity and Diversity

Information Technology

Light-Pollution Abatement

NexGen

Nominating

Observing

Stuart Heggie

Dr. Chris Gainor

Michael Watson

Dr. Chris Gainor

Lauri Roche

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Clark Muir

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Halifax

Hamilton

Kingston

Kitchener-Waterloo

London

Mississauga

C. F. de Montréal

Montréal

New Brunswick

Niagara

Okanagan

Ottawa

Don Town

Steve Donaldson

Judy Sterner

Eric Klazus

Alister Ling

Patrick Kelly

Abigail Hughes

John Hurley

Jim Goetz

Jim Fairles

Rick Saunders

Jo VandenDool

Patrice Scattolin

Frank Tomaras

June MacDonald

Pauline Horton

Richard Christie

Karen Finstad

Prince George

Regina

St. John's

Sarnia

Saskatoon

Sunshine Coast

Thunder Bay

Toronto

Vancouver

Victoria

Windsor

Winnipeg

Yukon

Members

Rob Woods

Ross Parker

Marcellus Redmond

Marty Cogswell

Les Dickson

Daniel Sklazeski

Mitchell Bagden

Laila Zichmanis

Ralph Chou

Paul Delaney

Kenneth Lui (joint)

Hayley Miller (joint)

Nelson Walker

Tom Sobocan

Dennis Lyons

Peter von Gaza

Randall Rosenfeld

ANNUAL GENERAL MEETING 2022—AGENDA

THE ROYAL ASTRONOMICAL SOCIETY OF CANADA LA SOCIÉTÉ ROYALE D'ASTRONOMIE DU CANADA



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Annual General Meeting 2022

The Annual General Meeting of members will be held on Sunday, 2022 June 26 at 4:00 p.m. PDT (7:00 EDT)
by Teleconference.

Agenda

1. Minutes of the 2021 Annual General Meeting

Published in the on-line version 2021 Annual Report, and located on the Members-only section on the website
(www.rasc.ca/annual-meeting-minutes)

2. Reports of Officers

President	(Robyn Foret)	Financial Statements	
1st Vice-President	(Charles Ennis)	Motion to approve the financial statements	
2nd Vice-President	(Michael Watson)	Executive Director	(Phil Groff)
National Secretary/Recorder	(Eric Briggs)		
Treasurer	(Catherine Carr)		

3. Reports of Permanent Committees

Astroimaging	(Stuart Heggie)	Inclusivity and Diversity	(Virginia Rufina Marquez-Pacheco)
Awards	(Dr. Chris Gainor)	Information Technology	(Walter MacDonald)
Constitution	(Michael Watson)	Light-Pollution Abatement	(Ed Reddy)
Education	(Lauri Roche)	NextGen	(Aline Alcaraz)
Editorial Board	(Dr. Chris Gainor)	Nominating	(Robyn Foret)
Finance	(Catherine Carr)	Observing	(Blake Nancarrow)
History	(Clark Muir)		

4. Reports of Other Committees

Dorner Telescope Museum (Randall Rosenfeld)
Robotic Telescope (Samantha Jewett)
Solar Eclipse (Randy Attwood)
General Assemblies (Randy Attwood)

5. Election of Board of Directors

6. Motion re By-Law Amendment

[Download the amendment as a .pdf](#)

7. Election of Auditor

8. Other Business

9. Adjournment

AGM MINUTES—2021

THE ROYAL ASTRONOMICAL SOCIETY OF CANADA
LA SOCIÉTÉ ROYALE D'ASTRONOMIE DU CANADA

Minutes of the Annual General Meeting,
Sunday, 2021 June 26 by Zoom.

1. Call to Order

The meeting was called to order at 18:02 EDT by President Robyn Foret (Calgary) with 118 members viewing the Zoom meeting.

Mr. Foret introduced Jennifer Howse (Calgary), educational specialist at the Rothney Astrophysical Observatory, and a member of the Métis Nation Region 3, who presented a territorial acknowledgment:

“Welcome to the Royal Astronomical Society of Canada’s annual general meeting. I would like to take this opportunity to acknowledge the traditional territories of all of the indigenous peoples across Canada. In considering what these territories are and what they symbolize I ask you as astronomers to consider your sense of place and time. According to Blackfoot ways of knowing, there are seven directions. The four cardinal points of north, south, east and west, but also where you are standing on the Earth, the ground beneath you, and the incredible expanse of sky above. Your place within these territories is best understood within the context of these seven directions. As a member of the Métis nation, I am very grateful for the diversity and inclusion goals of the RASC. More importantly, that this mission is not merely aspirational. You can be proud of all of the tangible actions to move this organization towards reconciliation. I encourage the executive and membership to continue with this very positive mission. Ninaskomitin [Welcome], ay-ay, thank you.”

Mr. Foret thanked Ms. Howse on behalf of the membership.

Mr. Foret introduced the Board of the RASC:

- Robyn Foret, President
- Chris Gainor, Past President (Victoria)
- Charles Ennis, 1st Vice President (Sunshine Coast)
- Michael Watson, 2nd Vice President (National)
- Catherine Carr, Treasurer (Toronto)
- Eric Briggs, Secretary (Toronto)
- Brendon Roy, Director (Thunder Bay)

Mr. Foret welcomed the Centre members and their representatives in attendance. He asked members to identify themselves in the chat window of the Zoom meeting.

(MOTION AGM2021-1:Ennis/Gainor) To approve the draft agenda as circulated in the Annual Report 2020. Carried.

Jenna Hinds (Outreach Co-ordinator) explained the features of Zoom relating to asking questions during the meeting.

2. Minutes of the 2018 AGM

The minutes of the 2020 Annual General Meeting had been circulated and published to all members of the Society in p.4-6 of the Annual Report 2020. The following motion was presented:

(MOTION AGM2021-2:Briggs/Ennis)

That the minutes of the 2020 AGM be adopted as published in the Annual Report 2020. Carried.

3. Reports of Officers

President—Robyn Foret (Calgary)

A report from the President was also published before the Meeting, in the Annual Report.

Mr. Foret gave remarks apart from his previously circulated written report. At the end of his one-year term as President, Mr. Foret thanked the membership for giving him the opportunity to serve, and thanked directors past and present whom he had worked with for the past 8 years.

1st VP’s Report—Charles Ennis (Sunshine Coast)

Mr. Ennis thanked Mr. Foret and added thanks to all society volunteers who stepped up to make everything work during challenging times. Also, he thanked members who made donations to the Society for the emergency fund to defray membership costs and other funds.

2nd VP’s Report—Michael Watson (National)

Mr. Watson briefly described the statutory responsibility of the 2nd Vice-President to act in the absence of both the President and 1st Vice-President. He noted he would speak again concerning By-Laws later.

Secretary—Eric Briggs (Toronto)

Mr. Briggs read from his previously circulated written report. He briefly described the by-law changes, and offered condolences to the families of the following members who passed during the reporting period:

- Anthony Adamson (Toronto)
- Diane Bell (Victoria)
- Steve Capling (Prince George)
- Mario Fabris (Windsor)
- Wayne Gilbank (Toronto)
- Scott Harlow (Sunshine Coast)
- Lloyd Higgs (Ottawa)
- Kevin Kimball (Montréal)
- John Murray (Windsor)
- Rev. Patrick Power (St. John’s)
- Barry Shanko (Vancouver)
- Elmore Wilson (Windsor)
- Walter Zukauskas (Halifax)

He also named Ted Oakes (Niagara), whose name was omitted from the written report and Ken Jackson (Vancouver), Joyce Sims (Niagara) and Rick Merion (Windsor) who passed after the end of the reporting period. After a moment of silence, Mr. Briggs noted that Peter Jedicke (London) wrote that Dr. Amelia Wehlau (London) had also passed away, and that the names of members who passed after the reporting period would be included in the Annual Report 2021.

Treasurer’s Report—Catherine Carr (Toronto)

Ms. Carr presented an overview of the written report and Finance Committee Report that was presented in the Annual Report. She noted that the Statement of Revenue and Expenses had been inadvertently omitted from the written report, so that statement would be presented as a slide and the statement would be added to the report on the website as soon as possible. She referred to SkyNews Inc. as the great turnaround, based on its conversion

from a \$64,171 operating loss to a gain of \$2424. She noted that the Society had experienced an excess of revenue over expenditures for 2020, \$24,459, and that that was an improvement on the previous year, when the operating loss was \$117,170 in 2019. She recommended referring to the Notes to the Audited Financial Statements in general, specifically Note 13 for further details on National Operations breakdowns.

MOTION AGM2021-3: Carr/Gainor that the audited financial statements be accepted.

Mr. Foret responded to a question from Andrew Bennett (Okanagan) about reduction in GA costs, and asked if costs might be expected to stay low once the GA was held in person again. Dr. Groff noted that the apparent loss from the 2019 GA was not actual, because of the way other income lines were reported. He reported that the subsequent remote GA, and the ongoing meeting was slightly profitable.

Ms. Carr responded to a question from Terry Bridges (Okanagan) by reporting the RASC had formalized its investment policy for the Helm Fund with Scotia McLeod.

Ms. Carr responded to a question from Robert Dick (Ottawa) that all lawsuits had been settled and fully recognized in financial statements, and only affected *SkyNews* figures.

Ms. Carr responded to a question about a light pollution expense, that it was for attendance of an international conference concerning light pollution abatement.

MOTION AGM2021-3 was Carried.

4. Reports of Permanent Committees

Awards—Stuart Heggie (Toronto)

Stuart Heggie (Toronto) provided a brief verbal update on the Astro-Imaging Certificate Program. An uptick in participation was reflected in 22 new certificates awarded. He thanked the crew, especially Reem Khalifeh for help. He noted that critiques provided by examiners were welcomed by the applicants.

Dr. Gainor presented the following RASC Awards:

Fellowship Award

- Roland Dechesne (Calgary)
- James Edgar (Regina)
- Michael Watson (National)

President's Award

- Renata Koziol

Service Awards

- Diane Bell (Victoria)
- Andrew Bennett (Okanagan)
- Zoltan Boda (Okanagan)
- Darrell Chatfield (Saskatoon)
- Paul Delaney (Toronto)
- Ellen Dickson (Saskatoon)
- Les Dickson (Saskatoon)
- Blair MacDonald (Halifax)
- Ron Waldron (Saskatoon)
- Ian Wheelband (Toronto)

Dr. Gainor noted that other awards of the Society were not awarded this year due to low numbers of members nominated for them.

Education and Public Outreach Committee—Lori Roche (Victoria)

Lori Roche (Victoria) presented a brief verbal update from the Education and Public Outreach Committee. She thanked Jenna Hinds and Samantha Jewett and committee members for their help. She directed members to visit the new Creation Station webpage. She thanked members of the Hamilton Centre for

help revamping the NOVA Program (New Observers in Visual Astronomy). She noted that Indigenous Resources were planned to be compiled in the coming year.

Editorial Board—Dr. Gainor (Victoria)

Dr. Gainor presented a brief verbal update from the Editorial Board, which replaced the Publishing Committee. He noted Paul Gray (New Brunswick) was completing his final Observer's Calendar for 2022, with help from Chris Beckett (National) incoming. Further to the 2020 report, he noted the success of the 2021 Night Sky Almanac by Nicole Mortillaro (National).

History Committee—Clark Muir (Kitchener-Waterloo)

Clark Muir (Kitchener-Waterloo) briefly reported on Historical Committee activities.

Inclusivity and Diversity Committee—Virginia Rufina Marquez-Pacheco (Montréal)

Virginia Rufina Marquez-Pacheco (Montréal) reported on Inclusivity and Diversity Committee activities.

Information Technology Advisory Board—Walter MacDonald (Kingston)

Walter MacDonald (Kingston) reported on the Information Technology Advisory Board activities. The major activity of the committee was converting the website hosting to Amazon Web Services, with the help of Curious Orbit. He noted that the new Driven system for logging in to the members section of the rasc.ca website and also secure.rasc.ca now asked for members' e-mail addresses to log in, and not their usernames as before. Mr. MacDonald offered many thanks to David Lane (Halifax) for his many years of running this department.

Light-Pollution Abatement—Bob King (Calgary)

Bob King (Calgary) reported on Light Pollution Abatement Committee activities, notably consolidation of the operators of parks in the Dark Sky Preserve program after varying periods of no communications with various of the preserves. Mr. King reported that the Artificial Light at Night international conference would be hosted with participation from the RASC committee in Calgary in August 2023.

Next Gen Committee—Emilie Lafleche (Montréal)

Emilie Lafleche (Montréal) introduced the new Next Gen Committee. The Next Gen Committee's purpose is to address the needs of current and future RASC youth members (meaning members between 13 and 25 years of age, inclusive) as they relate to programs and services of the Society. The committee serves to represent the unique viewpoints, values, and experiences of the Society's youth members as they apply to their RASC membership, including a core dedication to upholding the ideals of respect, inclusivity, and diversity within the Society. The committee worked on projects including the Next Gen Scholarship Program \$1500 worth of scholarships to young members and free memberships. Also Passport to the Universe, a passport-sized booklet serving as an introduction to the RASC and to observing the night sky. The committee partnered with the Inclusivity & Diversity Committee for a RASC general census. The committee implemented Next-Gen specific merchandise going towards scholarships. Also the committee hosted Youth Day at the GA. Ms. Lafleche sincerely thanked the committee members.

Observing—Blake Nancarrow (Toronto)

Blake Nancarrow reported the activities of the Observing Committee as interim chair, further to the previously circulated

written report in the Annual Report 2020. He noted 40 observing certificates awarded, the fifth highest number of certificates of any year.

Public Speakers and Special Projects

Charles Ennis reported that no funds from the Public Speakers and Special Projects funds during the reporting period due to COVID, although there was a funds request from the Yukon Centre recently in 2021.

Robotic Telescope—Jenna Hinds

Jenna Hinds reported on Robotic Telescope activities, including telescope upkeep and a new opportunity from *SkyNews* Magazine, to align with a special astrophotography issue of the magazine in September/October 2021.

5. Election of Board Members

(MOTION AGM2021-4:Gainor/Whitehorne) that Charles Ennis assume the chair for the Election of Directors agenda item. Carried.

Mr. Ennis noted that four positions on the Board were available to be filled at this election, and there were four nominees whose candidate statements had been published for members to read. One of the positions was to fill the remaining one year of a term or a previous director. Three of the positions were for three-year terms.

Robyn Foret had stated that, if he was elected, he would fill the one-year term rather than any of the three-year terms.

In accordance with the Canada Not-for-profit Corporations Act, Mr. Ennis noted that further nominations may be made at the annual meeting.

If there were no further nominations, the four nominees will be acclaimed. Mr. Ennis asked for any further nominations of members for the position of director of the Society.

Robert Dick (Ottawa) asked to nominate Glenn Hawley. Mr. Ennis stated that Mr. Hawley's membership had been suspended under section 3.6 of By-law #1 and was ineligible. Peter Jedicke (London) expressed concerns about the suspension of Mr. Hawley.

Mr. Ennis stated that the Board had taken legal advice on this point, which advice did not come from Director and Society legal counsel Michael Watson. Mr. Ennis said that the Board was not in a position to disclose the reasons for the suspension without Mr. Hawley's consent.

Rick Saunders (London) also expressed concerns about the suspension of Mr. Hawley.

Michael Watson noted that there may be a perceived conflict with him answering Mr. Jedicke's question because he was himself a nominee, but he responded to Mr. Jedicke's concerns by referring to Robert's Rules. Specifically, that the chair had ruled the nomination ineligible, and that ruling could be challenged by an appeal of the ruling from the floor by bringing a motion to appeal, that would require a seconder, and would not be debatable. If the chair's ruling was defeated by a simple majority then the ruling would be overturned.

(MOTION AGM2021-5:Jedicke/Dick) to sustain the chair's ruling on Mr. Hawley's eligibility. Sustained.

There being no further nominations, Mr. Ennis therefore declared the four nominees to be elected. He yielded the chair back to Mr. Foret.

6. By-law Amendment

Mr. Watson briefly described amendments to By-law No.1 of the Society, Section 2.1, 5.2, 8.4, 8.5 and 9.4.14, to be ratified at the Annual Meeting.

(MOTION AGM2021-6:Constitution Committee) that the proposed amendments to By-Law #1 of the Society, be approved. Carried.

7. Election of Auditor

(MOTION AGM2021-7:Carr/Bennett) To Appoint as Auditors Tinkham and Associates for 2021. Carried.

8. Discussion

Mr. Foret briefly introduced the newly elected directors Betty Robinson, Malhar Kendurkar, Michael Watson (with a 3-year term) and himself, with a 1-year term.

Don Town (Belleville) asked for a feedback line to be opened up on the RASC forum in order to plan the 2022 event. Ms. Hinds concurred.

Katrina Ince-Lum (Toronto) on behalf of the Inclusivity and Diversity Committee asked, through the chair, Walter MacDonald (Kingston) if the RASC website could be made bilingual. Mr. MacDonald noted the work involved but approved of the intent and existing limited bilingual content.

Dennis Lyons (Winnipeg) on behalf of the membership thanked the staff for the excellent work they had done during the year, including outreach to Centres. He also thanked the Board for their work on the new management model.

Rick Saunders described documentation of R.H. Kingston, the founder of the London Centre, and asked who to send it to for curation. Mr. Foret recommended Mr. Saunders contact the Historical Committee chair Clark Muir, via Phil Groff in his role as executive director.

Mr. Dick noted that the Board of Directors in a committee of the whole represented the Nominations Committee for the current period, and asked why that was. Mr. Watson responded that he discussed this at a recent National Council meeting, when he said that an unusual number of vacancies had opened leading up to that time, and the difficulty of getting interested volunteers to take those roles. He reported that the Board considered the prospect of Board members approaching Centres for nominations might prove more fruitful than drawing upon responses from national councillors.

Andrew Bennett asked if he could make a donation targeted to a specific committee. Mr. Foret responded that there were several ways to make targeted donations to certain funds, but not to specific committees. Mr. Ennis and Dr. Groff noted that pitches for targeted donations would be gratefully accepted by fundraising co-ordinator Lisa Di Veto.

David Chapman asked for details about reports being canvassed by the Light-Pollution Abatement Committee from Dark-Sky Preserves, but he retracted his question with the intent to address the chair, Bob King, individually.

John Hurley asked if any of the other board members needed to be elected. Mr. Foret responded that three board positions were nominally electable each year, for 3-year terms. He noted that Chris Gainor, Eric Briggs and himself would complete their terms in 2022 and that Brendan Roy, Catherine Carr and Charles Ennis would complete their terms in 2023.

Morrie Portnoff (Montréal) noted that in the Montréal Centre the issue of the French language was very real, and that the lack of bilingual material affected Montréal Centre membership. However, he noted that there was a separate Centre Francophone de Montréal. He noted that public outreach events in Montréal were very popular and were bilingual. He said that any French language material from the RASC would be greatly appreciated.

Mary-Lou Whitehorne (Halifax) also commented about bilingual astronomy public outreach literature, and collaboration

with groups such as the Fédération de Astronomes Amateurs du Québec, and the limited depth of such collaborations.

Karim Jaffer (Montréal) also addressed bilingual issues, noting that most astronomers were primarily anglophone or francophone, but not primarily both. He also noted the effectiveness and limitations of artificial intelligence translation.

9. Adjournment

Mr. Foret noted that the agenda had been completed, so the meeting could be adjourned without a motion to adjourn, according to Robert's Rules.

The meeting was adjourned at 20:05 EDT.

Respectfully submitted,

Eric Briggs

National Secretary

PRESIDENT'S MESSAGE

Fellow members of the RASC, please enjoy my final report to the Membership.

As the 2021–2022 year unfolds for the Society, the traditional period between Annual General Meetings, I find myself reflecting on the past eight years that I've had the honour and privilege to serve this august and storied Society on its Board of Directors.

During this time I've served with and under different Past Presidents, Presidents, Vice-Presidents, Treasurers, Secretaries, Directors, and alongside three different Executive Directors. In every instance, I was honoured to serve with volunteers who dedicated a tremendous amount of their time and energy toward the betterment of the Society. Every one of these fine individuals had a desire to make the Society better in some way and brought forth new ideas and supported others' ideas to move us forward. Many times, these amazing people found themselves embroiled in unforeseen events, in pursuing unexpected and sometimes controversial opportunities, and in celebrating many accomplishments and victories along the way.

This distinguished group of volunteers, most of whom are still engaged with the Society in some way, have accomplished a lot. We have a solid Mission and Vision and our Objectives are articulated in our five pillars of providing Value to our Members, to our Centres, to the Public, to the Scientific Community and in a Financially sustainable way. We acquired *SkyNews* magazine and turned that into a profitable part of our publishing business. We acquired a Robotic Telescope and continue to build programs around that asset. We added to our fine list of publications and now include in that the first joint venture with Firefly books where the quality of the RASC's content, combined with Firefly's meticulous attention to detail and professional publishing elements, has created a wildly successful addition to astronomy annuals. Authored by Nicole Mortillaro and illustrated by Peter Kovalik and under the guidance of the Firefly team led by Julie Takasaki, this fledgling Almanac reached best-seller status in its first year of publication and, despite COVID complications, doubled that in its second year of print. We created the Inclusivity and Diversity Committee to ensure that in the RASC, the stars do belong to everyone. We created the NextGen Committee to ensure that the Society addresses the needs of the next generation of RASC members, and which also provides an incubator for the next generation of leaders. We continue to recognize the great work by individuals and groups within the Society with our annual

awards. And we learned how to pivot like never before, bringing the Society to the masses in new and varied ways. From that, we see an increase in membership, an increase in participation in programs such as our Observing Certificate program and our Astroimaging Certificate programs and opportunities that are frankly beyond the capacity of our growing team. In fact we find ourselves in the enviable position of being selective in our program execution to ensure success and sustainability in our long-term endeavours.

We've also consciously created new staff and contractor positions to address critical aspects of our business that require day to day operational attention, with staff focused on Membership, Outreach, Marketing and Communication, Publishing, and the Environment, particularly the nocturnal environment. Our contract positions encompass Accounting and Fundraising. Fundraising embraces donations and grant funding and has contributed to approximately \$3.5M in new funding for the Society in the past 5 years. We've also moved the Board of Directors to a governance role, providing focus, direction, structure, and accountability, and defining the rules of engagement in our ever-evolving By-Law #1 and the Policy Manual. Reporting to the Board, our Executive Director and his team focus on the ever-complex operation of the Society.

We've also had our share of challenges, with societal issues that caused us to revisit and close gaps in our Policy and By-Law, software and supply-chain issues exacerbated by COVID-19 and of course COVID-19 itself. Despite being forced into a non-contact work model where the workplace is virtual but the work to be done is tangible, we succeeded where we needed to. We're still digging out from under some of the challenges, but to keep this in the glass half-full category, we have more members, a larger team dedicated to the Society's day-to-day operation and success, a thriving *SkyNews* magazine, a wildly successful publishing business, a balanced budget, money in the bank and most importantly, volunteers across the Country who are dedicated to the success and continuation of the RASC. To have played a role in all of that, with all of my fantastic peers and colleagues, these past eight years leave me humbled and full of thanks. It has been such a privilege to have served you all and to have served this extraordinary institution.

With thanks.

Robyn Foret

President

EXECUTIVE DIRECTOR'S REPORT

Fellow RASC members,

2021 was certainly an eventful year, both in the world, and in our Society. Political turmoil shook our neighbour to the south, as the year began with an unprecedented riot in the US Capitol. Catastrophic weather events affected both Canada and the world. The discovery of unmarked graves on the grounds of residential schools confirmed the worst fears of many. The Taliban took over in Afghanistan. Space travel became the newest ground for competition among billionaires. And, of course, the Covid Pandemic continued to dominate the headlines as vaccines and preventive measures went head to head with successive waves of infection.

Within RASC, there were numerous upheavals, as well. Our necessary move to a new membership database and ecommerce platform did not roll out as smoothly as planned. Our new shipping and fulfilment house proved incapable of meeting our needs, leaving many members waiting unacceptably long for their Observer's Handbooks and other orders. There was turnover among key office staff, and the office itself had to leave its long-standing location.

While all these challenges made 2021 a difficult year, and in some cases have left issues that are still being solved in 2022, nonetheless RASC remained strong and resilient. The move to the new office space, born of necessity, promises a literal new lease on life, as our new location should serve our needs for many years to come, including offering the opportunity to finally display the collection of our Dorner Telescope Museum to good effect. The turnover in core staff, has allowed for the opportunity to hire several talented new individuals who will help the Society to grow and prosper in 2022 and beyond. Challenges in our core systems have provided the opportunity to reevaluate some of our policies and procedures, and will ultimately yield a stronger, more robust, Society infrastructure.

In addition, there were many areas in which 2021 was a great year for RASC. For just one example, the Observing Committee, supported by online offerings from Education and Outreach staff and volunteers, awarded significantly more certificates for observing programs in 2021 than in prior years. In addition, we developed new partnerships, such as the evolving relationship with the Canadian Space Agency. This was our best year in terms of grants and donations. While we make every effort to make our membership services, publications, and other projects self-sufficient, it is absolutely the case that without our success at fundraising, much of the good work of our Society would be impossible. And finally, *SkyNews* had its most successful year, to date. All of this is evidence that even in challenging times, RASC is able to meet and excel at its mission: To enhance understanding of and inspire curiosity about the Universe, through public outreach, education, and support for astronomical research.

All of this is made possible by our strong, engaged membership, and in particular the many volunteers to serve on our committees, our Centre councils, the National Council, and of course, our Board of Directors. I wish to personally thank each one of you for your tireless and often thankless work for your fellow members. I'd like to thank our fundraising coordinator, and all those who donated to RASC in 2021. I'd also like to thank all of the staff and contractors who worked hard through some or all of this challenging year.

And for 2022, and beyond... Excelsior!

Phil Groff
Executive Director

SECRETARY'S MESSAGE

During the year starting with the 2021 Annual Meeting on June 26th, there were five National Council meetings and fifteen Board meetings.

In the Policy Manual, Policy B8 (Board Voting Procedures) section concerning E-mail was amended. Policy R3 for the Dorner Endowment Fund was adopted.

By-law No.1 of the Society was amended, deleting Clause 9.1.4 (No person who is an elected officer of the Society may simultaneously be the President, Secretary, Treasurer, or a National Council Representative of a Centre) as reported elsewhere in this Annual Report, changes to be ratified at the Annual Meeting.

By-law No. 1, Clause 3.2 (Membership Transferability: A membership may only be transferred to the Society. Pursuant to subsection 197(1) (Fundamental Change) of the Act, a special resolution of the members is required to make any amendment to add, change, or delete this section of the By-Law.) was replaced with the following:

3.2 Relationship of Society and Centre Members

3.2.1 Every member of every Centre is a member of the Society, and is attached to the Centre of which he or she is a member. A person who for any reason ceases to be a member of the Society thereupon ceases to be a member of the Centre to which he or she was attached.

3.2.2 No person who is not a member of the Society may:

(i) exercise any rights of membership of any Centre, including voting rights;

(ii) stand for election as a director, councillor, officer or National Council Representative of a Centre.

We offer condolences to the families of the following members who passed during the year:

We offer condolences to the families of the following members who passed during the year:

- Thomas Wray, Michael James, and Paul Sheppard (Ottawa)
- Norm Folkers (Belleville)
- Tom Bolton, Alan Kosugi, Kulli Milles (Toronto)
- Jon Gunning, Dr. Amelia Wehlau (London)
- Ken Jackson (Vancouver)
- Joyce Sims (Niagara)
- Rick Marion (Windsor)
- Ingrid Wilcox, Gerry Whitley (Yukon)
- Sherman Williams (Halifax)

Eric Briggs
National Secretary

Membership Statistics 2011-2021

Centre	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
Belleville	32	35	35	31	26	28	33	28	31	30	31
Calgary	445	463	463	460	458	421	460	434	381	336	282
Edmonton	317	311	311	325	332	302	294	274	277	229	235
Fraser Valley	31										
Halifax	177	178	178	160	172	164	172	170	169	153	154
Hamilton	109	109	109	123	113	111	116	109	103	78	61
Kingston	69	63	63	60	64	67	65	72	75	66	66
Kitchener-Waterloo	153	134	134	142	135	114	126	130	109	115	106
London	106	114	114	116	115	119	124	129	110	126	104
Mississauga	196	177	177	180	183	170	179	188	168	132	123
C.F de Montréal	23	21	21	18	18	20	17	18	16	18	20
Montréal	161	171	171	169	143	135	126	117	109	110	91
New Brunswick	85	96	96	103	108	91	88	77	66	68	68
Niagara	85	100	100	98	95	88	78	73	62	69	69
Okanagan	116	145	145	141	133	133	122	124	115	106	92
Ottawa	401	391	391	387	372	358	361	343	319	325	328
Prince George	52	68	68	78	92	99	76	57	66	63	69
Québec					13	15	15	18	16	20	20
Regina	86	86	86	84	78	88	111	94	80	75	62
St. John's	57	79	79	74	60	61	58	57	58	47	44
Sarnia	18	15	15	16	11	15	14	20	12	11	15
Saskatoon	88	74	74	83	85	83	75	73	68	70	70
Sudbury	35	24	24								
Sunshine Coast	38	53	53	57	72	65	69	50	43	32	38
Thunder Bay	37	40	40	45	45	46	49	45	51	50	46
Toronto	643	757	757	803	824	860	904	869	782	611	573
Vancouver	272	284	284	262	254	236	254	217	198	226	228
Victoria	239	264	264	276	257	235	216	202	176	163	164
Windsor	91	100	100	104	116	106	107	96	84	90	100
Winnipeg	211	208	208	222	240	214	228	221	210	178	180
Yukon	24	32	32	34	32	44					
National Members	448	436	436	402	432	413	429	431	428	446	435
Honorary	14	15	15	14	15	15	15	15	15	15	15
	4955	5043	5043	5066	5093	4916	4981	4760	4410	4077	3908

Membership by Type

Type	Number	% of Total
Ordinary	3819	75.9
Family	750	14.9
Life	276	5.4
Youth	166	3.3
Honorary	(14)	.3

Membership by Country

Country	Number	% of Total
Canada	4806	95.5
USA	193	3.9
Other	29	.6

TREASURER'S MESSAGE

After the difficult year we all experienced in 2020 with the early lockdowns and other challenges from an international pandemic, we all started 2021 anticipating things would only get better. As we know, that turned out to be a false hope, and if anything, this past year proved even more challenging than the one before.

For that reason, I am particularly gratified to see how resilient RASC has proven, even in the face of infrastructure and staffing changes, rising supply chain costs, a new database launch, an office move, and ongoing challenges from our shipping and fulfilment house. Special thanks go to all RASC staff, management, and volunteers for their tireless, and often thankless, work throughout a difficult year.

Despite these challenges, RASC did remain financially stable. Changes in our database, and accounting staff, made for a more challenging audit than usual. Nonetheless I'm pleased to report that our auditors continued to be satisfied with our financial practices and management. We finished the year in a stronger financial position than we'd budgeted, with revenue exceeding expenditures by \$1,105,031 as compared to a surplus of \$24,459 in 2020.

This was due to the generosity of our members—indeed the largest single contribution toward that surplus was a \$1 million bequest from the estate of a former member. Also stronger than anticipated was the performance of our investments, including a banner year for SkyNews Magazine which added \$101,000 to our bottom line, compared to the more modest return of \$2,424 in 2020.

While Membership fees were higher in 2021 than in 2020, \$256,505 and \$241,459 respectively, a widening gap has appeared between the amount generated by membership fees, and that spent on member services, which was \$260,312. Taken together with our support of Centres and Centre outreach, at \$107,759, we are subsidizing our functions as an astronomy club with other sources of revenue. This gap is even wider in the budget approved for 2022, and thus some action will need to be taken to ensure that that core part of our business remains sustainable.

As we begin to pivot back to more in-person activities in 2022, we will need to maintain a close watch on those areas of expenditures, such as travel, and outreach, that were somewhat suppressed in 2020 and 2021, to ensure that we can continue to offer the high level of support that our members and the public have come to expect from us, even as we continue to offer online programs, including the 2022 GA, for which there is demonstrated demand.

I note with pride, that 2021, despite all its challenges, also marked a banner year for Observing and Astroimaging Certificates awarded, proof that our Society is still engaged in our core mission, and our members are undaunted in their love of the night sky. As things hopefully reopen in the coming year, I look forward to seeing many of my RASC friends again, in person. Until then, clear skies.

Catherine Carr
Treasurer

Financial Statements of

**THE ROYAL ASTRONOMICAL
SOCIETY OF CANADA**

**LA SOCIÉTÉ ROYALE D'ASTRONOMIE
DU CANADA**

December 31, 2021

D C Tinkham FCPA FCA CMC LPA
P J Brocklesby CPA CA LPA
M Y Tkachenko CPA CA
M W G Rooke CPA CA LPA
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INDEPENDENT AUDITOR'S REPORT

To the Members of
**The Royal Astronomical Society of Canada /
La Société Royale D'Astronomie Du Canada**

Qualified Opinion

We have audited the financial statements of The Royal Astronomical Society of Canada / La Société Royale D'Astronomie Du Canada ("the Society") which comprise the balance sheet as at December 31, 2021, and the statements of revenue and expenses, changes in net assets, and cash flows for the year then ended, and notes to the financial statements, including a summary of significant accounting policies.

In our opinion, except for the possible effects of the matter described in the *Basis for Qualified Opinion* section of our report, the accompanying financial statements present fairly, in all material respects, the financial position of the Society as at December 31, 2021, and the results of its operations and its cash flows for the year then ended in accordance with Canadian accounting standards for not-for-profit organizations.

Basis for Qualified Opinion

In common with many charitable organizations, the Society derives revenue from donations, the completeness of which is not susceptible of satisfactory audit verification. Accordingly, our verification of these revenues was limited to the amounts recorded in the records of the Society and we were not able to determine whether any adjustments might be necessary to donation revenue, excess of revenue over expenses, and cash flows from operations for the years ended December 31, 2021 and 2020, current assets as at December 31, 2021 and 2020, and unrestricted net assets as at January 1 and December 31 for both the 2021 and 2020 years. Our audit opinion on the financial statements for the year ended December 31, 2020 was modified accordingly because of the possible effects of this limitation in scope.

We conducted our audit in accordance with Canadian generally accepted auditing standards. Our responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Financial Statements* section of our report. We are independent of the Society in accordance with the ethical requirements that are relevant to our audit of the financial statements in Canada, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our qualified opinion.

Responsibilities of Management and Those Charged with Governance for the Financial Statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with Canadian accounting standards for not-for-profit organizations and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing the Society's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Society or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Society's financial reporting process.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Canadian generally accepted auditing standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with Canadian generally accepted auditing standards, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Society's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast doubt on the Society's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Society to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

TORONTO, Ontario
June 6, 2022



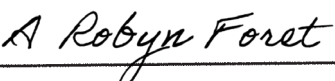
Licensed Public Accountants

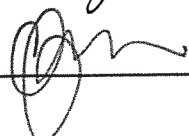
THE ROYAL ASTRONOMICAL SOCIETY OF CANADA
LA SOCIÉTÉ ROYALE D'ASTRONOMIE DU CANADA
 Balance Sheet

As at December 31	2021	2020
Assets		
Current		
Cash	\$ 1,109,748	\$ 275,219
Accounts receivable	96,754	25,977
Accounts receivable SkyNews Inc. (note 5)	34,983	-
Loan receivable from SkyNews Inc.	-	4,500
Inventory	31,759	34,028
Prepaid expenses	22,808	8,010
	1,296,052	347,734
Long term		
Investments (note 4)	602,368	529,319
Investment in SkyNews Inc. (note 5)	238,529	136,990
Capital assets (note 6)	102,739	91,351
Collections (note 7)	55,079	34,646
	998,715	792,306
	\$ 2,294,767	\$ 1,140,040
Liabilities		
Current liabilities		
Accounts payable and accrued liabilities	\$ 117,019	\$ 34,641
Deferred revenue		
Membership fees for ensuing years	141,809	163,119
Journal subscriptions	14,828	23,550
Unamortized life membership fees (note 8)	10,602	13,252
	284,258	234,562
Loan payable (note 9)	40,000	40,000
	324,258	274,562
Net Assets		
Unrestricted	1,345,902	312,739
Internally restricted (note 12)	624,607	552,739
	1,970,509	865,478
	\$ 2,294,767	\$ 1,140,040

Commitments (note 11)

On behalf of the Board:

 President

 Treasurer

See accompanying notes to financial statements.

3

THE ROYAL ASTRONOMICAL SOCIETY OF CANADA
LA SOCIÉTÉ ROYALE D'ASTRONOMIE DU CANADA
Statement of Changes in Net Assets

Year ended December 31	Internally Restricted (note 12)	Unrestricted	2021	2020
Balance, beginning of year	\$ 552,739	\$ 312,739	\$ 865,478	\$ 841,019
Excess of revenue over expenses for the year	-	1,105,031	1,105,031	24,459
Transfers (note 12)	71,868	(71,868)	-	-
Balance, end of year	\$ 624,607	\$ 1,345,902	\$ 1,970,509	\$ 865,478

See accompanying notes to financial statements.

4

THE ROYAL ASTRONOMICAL SOCIETY OF CANADA
LA SOCIÉTÉ ROYALE D'ASTRONOMIE DU CANADA
Statement of Revenue and Expenses

Year ended December 31	2021	2020
Revenue		
Donations (note 10)	\$ 1,111,057	\$ 113,840
Publication sales	276,507	241,459
Membership fees	256,505	243,050
Grants (note 10)	229,692	224,640
SkyNews Inc.	101,539	2,424
Cost recovery SkyNews Inc.	69,315	-
Investment income	65,448	8,921
Miscellaneous	10,010	9,001
	2,120,073	843,335
Expenses		
National operations (note 13)	272,265	246,950
Member services (note 13)	260,312	233,774
Publications	236,120	135,155
Programming		
Centre support / public outreach (note 13)	107,759	109,487
Youth Outreach and education	43,111	46,076
Robotic telescope	32,684	24,152
Telescope museum	24,646	16,460
Light pollution prevention (note 13)	20,488	6,822
General assembly	17,657	-
	1,015,042	818,876
Excess of revenue over expenses for the year	\$ 1,105,031	\$ 24,459

See accompanying notes to financial statements.

5

THE ROYAL ASTRONOMICAL SOCIETY OF CANADA
LA SOCIÉTÉ ROYALE D'ASTRONOMIE DU CANADA
 Statements of Cash Flows

Year ended December 31	2021	2020
Cash provided (used) by operating activities		
Excess of revenue over expenses for the year	\$ 1,105,031	\$ 24,459
Charges not requiring a current cash payment or receipt		
Amortization of capital and intangible assets	13,424	19,684
Amortization of life membership fees	(2,650)	(2,650)
SkyNews Inc. income	(101,539)	(2,424)
	1,014,266	39,069
Changes in non-cash working capital components		
Accounts receivable	(70,777)	(6,297)
Accounts receivable from SkyNews Inc.	(34,983)	-
Inventory	2,269	455
Prepaid expenses	(14,798)	12,828
Accounts payable and accrued liabilities	82,378	(9,222)
Deferred revenue	(30,032)	14,951
	948,323	51,784
Cash provided (used) by investing activities		
Investments (net)	(73,049)	64,336
Loan to SkyNews Inc. (net of repayments)	4,500	18,000
Purchase of capital and intangible assets	(24,812)	(46,642)
Purchase of items for collections	(20,433)	(13,864)
	(113,794)	21,830
Cash provided (used) by financing activities		
Proceeds from loan (note 9)	-	60,000
Loan forgiveness (note 9)	-	(20,000)
	-	40,000
Increase in cash during the year	834,529	113,614
Cash, beginning of year	275,219	161,605
Cash, end of year	\$ 1,109,748	\$ 275,219

See accompanying notes to financial statements.

6

THE ROYAL ASTRONOMICAL SOCIETY OF CANADA

LA SOCIÉTÉ ROYALE D'ASTRONOMIE DU CANADA

Notes to Financial Statements

December 31, 2021

1 Organization

The Royal Astronomical Society of Canada / La Société Royale D'Astronomie Du Canada ("the Society") is a Canadian corporation without share capital and a registered charitable organization, incorporated for the purpose of stimulating interest in and promoting astronomy and related sciences. The Society is not subject to income taxes pursuant to exemptions accorded to registered charities in the income tax legislation.

2 Significant accounting policies

These financial statements have been prepared by management in accordance with Canadian accounting standards for not-for-profit organizations.

a) Cash

Cash includes cash on hand and deposits in financial institutions.

b) Investments

The Society has elected to value all investments, with the exception of the investment in SkyNews Inc., at fair value, which is based on quoted market values.

c) Investment in SkyNews Inc.

The Society purchased SkyNews Inc., a private corporation, on June 29, 2015 to further the Society's mission. SkyNews Inc. publishes a highly regarded magazine which provides an excellent source of educational information on astronomy and allied sciences to the public.

The Society owns 100% of the shares of SkyNews Inc., a profit oriented entity, and accordingly controls the corporation. The Society has elected to account for the investment using the equity method.

d) Inventory

Inventory is comprised of publications and promotional items for re-sale and is carried at the lower of cost and net realizable value. Cost is determined on an average cost basis.

e) Collections

Collections are capitalized in the Society's balance sheet but not amortized. Collections consist of a library and the Dorner Telescope Museum. The library is recognized at a nominal value. The museum collection is recognized at cost as items are purchased. Costs incurred to maintain these collections are expensed as incurred.

f) Capital assets

Capital assets are recorded at cost. Cost comprises the purchase price and any directly attributable cost of preparing the asset for its intended use.

When conditions indicate a capital asset no longer contributes to the Society's ability to provide services or that the value of future economic benefits or service potential associated with the capital asset is less than its net carrying amount, its net carrying amount is written down to its fair value or replacement costs. As at December 31, 2021, no such impairment exists.

Amortization is provided over the estimated useful lives of the assets using the straight-line basis as follows:

Tangible assets:	Telescope	7 years
	Computer hardware	3 years
	Office furniture	10 years
	Leasehold improvements	15 months
Intangible assets:	Software	5 - 10 years
	Website development	3 years, 1/2 in year of acquisition

2 Significant accounting policies continued

g) Revenue recognition

i) Membership fees

Membership fees received in the first half of the year are recognized during the current year. Those received in the second half of the year are recorded as deferred revenue and recognized in the following year. The Society previously offered life memberships to members. Life memberships received in prior years were credited to unamortized life membership fees liability account, as described in note 8. The unamortized life membership fees are being recognized as revenue evenly over 10 years to 2025.

ii) Contributions

The Society follows the deferral method of accounting for contributions. Unrestricted contributions are recognized as revenue when received or receivable, if the amount to be received can be reasonably estimated and collection is reasonably assured.

iii) Investment income

Investment income is recognized on an accrual basis. Changes in the unrealized gain or loss on investments, being the difference between cost and fair value, is recognized in investment income for the year.

iv) Subscriptions and publications

Journal subscription revenues are amortized into income over the subscription period. Publications are recognized as revenue when shipped.

h) Contributed services

The Society is dependant on the voluntary services of many individuals. The value of donated services is not recognized in these financial statements.

i) Allocation of common expenses

The Society allocates a number of its expenses by function: national operations, member services and certain programming. The costs of each function include an allocation of the costs of personnel, fundraising and computer and IT costs.

Personnel costs are allocated based on the number of hours spent on each function; fundraising expenses are allocated primarily to national operations as the majority of cost relates to general fundraising activities. Smaller portions are allocated to member services and public outreach for expenses related to fundraising for Centres and communications with members. Computer and IT costs are allocated based on the estimated usage of technology by each function.

j) Management estimates

The preparation of financial statements in accordance with Canadian accounting standards for not-for-profit organizations requires management to make estimates that affect the reported amounts of assets and liabilities, disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenses during the reporting period. Significant estimates include the impairment of financial assets and the useful lives of capital assets. All estimates are reviewed periodically and adjustments are made to the statement of revenue and expenses as appropriate in the year they become known.

2 Significant accounting policies continued

k) Financial instruments

i) Measurement

The Society initially measures its financial assets and financial liabilities at fair value. The Society subsequently measures all its financial assets and financial liabilities at amortized cost except for its investments which are measured at fair value. Changes in fair value are recognized in the statement of revenue over expenses for the year.

ii) Impairment

At the end of each reporting period, the Society assesses whether there are any indications that a financial asset measured at amortized cost may be impaired.

Objective evidence of impairment includes observable data that comes to the attention of the Society. When there is an indication of impairment, the Society determines whether an adverse change has occurred during the period in the expected timing or amount of future cash flows from the financial asset. There are no indications of impairment of financial assets as at December 31, 2021.

iii) Transaction costs

Transaction costs are recognized in the statements of revenue and expenses in the period incurred, except for financial instruments that will be subsequently measured at amortized cost. Investment management fees associated with the ScotiaMcLeod managed portfolio are expensed as incurred.

3 Helm Fund

The Society is trustee of an endowment fund created by Mr. Walter J. Helm (a former Royal Astronomical Society of Canada member) who passed away June 5, 1960. In his will he provided a bequest to the Society that was to be used to support the general purposes of the David Dunlap Observatory (DDO) in Richmond Hill, Ontario. Under the terms of a 2010 court interpretation, the income of the Helm Fund is presently being applied in support of on-going public education programs at the DDO site.

The fair value of the total assets of the Helm Fund under administration by the Society at December 31, 2021 is \$820,874 (2020 - \$724,199) and is excluded from the Society's financial statements as the Society is not the legal owner or beneficiary of the Fund.

THE ROYAL ASTRONOMICAL SOCIETY OF CANADA
LA SOCIÉTÉ ROYALE D'ASTRONOMIE DU CANADA
Notes to Financial Statements
December 31, 2021

4 Investments

As at December 31	2021	2020
Managed portfolio at ScotiaMcLeod		
Fixed income investments	\$ 256,546	\$ 239,314
Canadian equity investments	205,752	180,102
U.S. equity investments	125,636	100,262
Cash	6,434	9,641
Guaranteed investments certificate		
RBC, matures April 8, 2022, 0.04% interest	8,000	-
	\$ 602,368	\$ 529,319

The fixed income portfolio is comprised of government and corporate bonds with stated interest rates ranging from 1.75% to 3.55% (2020 - 1.75% to 3.55%), maturing on dates ranging from June 15, 2022 to March 2, 2026 (2020 - March 5, 2021 to September 1, 2025).

The Canadian equity investments is comprised of share and trust units of 38 Canadian entities of which the single largest holding is 88 shares of Royal Bank with a market value of \$11,814 (2020 - 98 shares of Royal Bank with a market value of \$10,250).

The U.S. equity investments is comprised of share and trust units of which the single largest holding is 36 shares of Apple Inc. with a market value of \$6,363 US\$ (2020 - 23 shares of Microsoft Corp. with a market value of \$5,116 US\$).

The fixed income and equity investments have been recorded at market values based on pricing information provided by ScotiaMcLeod.

5 Investment in SkyNews Inc.

The Society purchased 100% of the common shares of SkyNews Inc. on June 26, 2015. The fiscal year end of SkyNews Inc. is March 31, accordingly, the net income for the year ended March 31, 2021 has been recognized in the financial statements of the Society in 2021. The following summary is taken from the unaudited financial statements of SkyNews Inc.

As at March 31	2021	2020
Total assets	\$ 159,871	\$ 90,289
Total liabilities	231,232	263,189
Total deficit	(71,361)	(172,900)
Year ended March 31	2021	2020
Total revenue	\$ 545,268	\$ 557,884
Total cost of sales	362,622	420,664
Total expenses	81,107	134,796
Net income for the year	\$ 101,539	\$ 2,424

There is significant uncertainty as to whether the investment in SkyNews Inc. is impaired. Management estimates that no impairment exists at December 31, 2021 due to changes implemented at SkyNews Inc. The investment is recognized on the balance sheet at \$238,529 however it is possible that the investment may be unrecoverable in future years.

Pursuant to an agreement dated January 1, 2021, the Society has allocated salaries to SkyNews in the amount of \$69,315 of which \$34,983 is receivable at December 31, 2021 (2020 - \$nil).

Included in membership services expense is \$46,149 (2020 - \$48,342) for purchases of SkyNews Magazine in the year which is distributed to Society members as part of their membership subscription. The Society also expensed \$1,495 (2020 - \$6,236) in advertising and marketing for advertisements in SkyNews Magazine.

THE ROYAL ASTRONOMICAL SOCIETY OF CANADA
LA SOCIÉTÉ ROYALE D'ASTRONOMIE DU CANADA
Notes to Financial Statements
December 31, 2021

5 Investment in SkyNews Inc. (continued)

These transactions were made in the normal course of operations and have been measured at the exchange amount, which is the amount of consideration established and agreed to by the related parties.

6 Capital assets

As at December 31	2021		2020	
	Cost	Accumulated Amortization	Cost	Accumulated Amortization
Tangible assets				
Telescope	\$ 51,947	\$ 27,829	\$ 51,947	\$ 20,408
Computer hardware	22,950	22,457	22,950	20,978
Office furniture	6,664	4,015	6,664	3,614
Leasehold improvements	2,147	143	4,989	4,989
Intangible assets				
Software	106,300	32,825	150,669	96,204
Website development	13,715	13,715	13,715	13,390
	\$ 203,723	\$ 100,984	\$ 250,934	\$ 159,583
Net book value		\$ 102,739		\$ 91,351

7 Collections

As at December 31	2021	2020
Dorner Telescope Museum	\$ 55,078	\$ 34,645
Library	1	1
	\$ 55,079	\$ 34,646

8 Unamortized life membership fees

	2021	2020
Life membership fees as of January 1	\$ 13,252	\$ 15,902
Deduct: Amortization to income	(2,650)	(2,650)
Balance, December 31	\$ 10,602	\$ 13,252

9 Canada Emergency Business Account (CEBA) loan

The Society received a \$60,000 loan under the federal government's Canada Emergency Business Account (CEBA) program which provides assistance to small businesses and not-for-profit organizations in paying non-deferrable operating expenses.

The loan is interest free and no payments are required until December 31, 2023. Any portion of the loan can be repaid at any time without penalty. Provided \$40,000 of the CEBA loan is repaid on or before December 31, 2023, the remaining \$20,000 will be forgiven. The Society recognized the forgivable portion as government assistance included in grants in the statement of revenue and expenses at December 31, 2020 as there is reasonable assurance that the Society will be entitled to the grant.

If the loan is not repaid in full by December 31, 2023, the government assistance will be reversed and the full \$60,000 loan would become payable. Interest would be payable monthly, charged at 5% and the balance of the loan would be due in full December 31, 2025.

THE ROYAL ASTRONOMICAL SOCIETY OF CANADA

LA SOCIÉTÉ ROYALE D'ASTRONOMIE DU CANADA

Notes to Financial Statements

December 31, 2021

10 Donations and grants

Included in donations is a single bequest in the amount of \$1,000,000 received in December 2021.

Included in grants is government assistance totaling \$6,350 (2021 - \$44,435, which includes the CEBA loan forgiveness referred in note 9).

11 Commitments

The Society leases space for offices and a museum which expires on December 31, 2031.

The minimum annual payments, excluding HST, over the term of the lease are as follows:

2022	\$	55,728
2023		57,672
2024		59,616
2025		61,560
2026		<u>63,504</u>
Total	\$	<u>298,080</u>

In addition the lease requires additional rent estimated to be \$40,980 per annum.

The Society also has an ongoing commitment for the remote observatory and telescope hosting which extends to May 1, 2022. Annual payments totaling \$6,600 for 2022 are required under this agreement.

12 Internally restricted net assets

The Society has internally restricted certain funds. The Ruth Northcott Education Fund was established in 1969 and funds are used for a variety of specified purposes related to public education and outreach. The RASC Legacy Fund was established in 1990 for the purpose of providing for the long-term growth of the Society. The Dörner Telescope Museum Fund was established in the current year.

An amount equal to the investment income for the year is transferred to all funds annually on a proportionate basis. All disbursements from these funds must be approved by the Board of Directors.

				2021	2020
	Dörner Telescope Museum Fund	Ruth Northcott Education Fund	RASC Legacy Fund	Total	Total
Balance, January 1	\$ -	\$ 234,312	\$ 318,427	\$ 552,739	\$ 545,434
Transferred from (to) unrestricted net assets:					
Investment income	-	17,966	24,609	42,575	3,652
Donations	25,000	4,198	845	30,043	5,063
Expenses	-	-	(750)	(750)	(1,410)
	25,000	22,164	24,704	71,868	7,305
Balance, December 31	\$ 25,000	\$ 256,476	\$ 343,131	\$ 624,607	\$ 552,739

THE ROYAL ASTRONOMICAL SOCIETY OF CANADA**LA SOCIÉTÉ ROYALE D'ASTRONOMIE DU CANADA**

Notes to Financial Statements

December 31, 2021

13 Expense allocations

Personnel, fundraising and computer and IT costs were allocated as follows:

Year ended December 31	2021			2020		
	Personnel costs	Fundraising expenses	Computer & IT costs	Personnel costs	Fundraising expenses	Computer & IT costs
National operations	\$ 65,078	\$ 46,897	\$ 8,139	\$ 67,047	\$ 44,927	\$ 8,424
Member services	144,967	5,862	16,279	117,245	5,616	16,848
Public outreach	87,162	5,862	8,139	90,501	5,616	8,424
Light pollution prevention	20,384	-	-	6,822	-	-
	\$ 317,591	\$ 58,621	\$ 32,557	\$ 281,615	\$ 56,159	\$ 33,696

14 Financial instruments

The Society is exposed to various risks through its financial instruments. The following analysis provides a measure of the Society's risk exposure and concentrations.

Credit risk

Credit risk is the risk that one party to a financial instrument will cause a financial loss for the other party by failing to discharge an obligation. The Society is exposed to credit risk through its cash, accounts receivable, loan receivable and investments. Credit risk related to cash is minimal as funds are fully insured and held by credit-worthy parties. Accounts receivable are generally unsecured. The investment policy requires diversification of investments within categories, and sets limits on exposure to individual investments.

Liquidity risk

Liquidity risk is the risk that the Society will not be able to meet a demand for cash or fund its obligations as they come due. The Society meets its liquidity requirements by ensuring adequate cash is maintained and investments are available to be converted to cash if and when required.

Market risk

Market risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market prices. Market risk is comprised of currency risk, interest rate risk and other price risk.

Currency risk

Currency risk reflects the risk that the Society's earnings will decline due to the fluctuations in foreign exchange rates. The Society has cash, investments and accounts receivable denominated in U.S.\$ totaling \$129,044 US\$ at December 31, 2021 (2020 - \$145,758). The exchange rate used to convert US\$ assets at December 31, 2021 is \$1 US = \$1.2678 Cdn (2020 - \$1.2732 Cdn).

Interest rate risk

Interest rate risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market interest rates. The Society is subject to interest rate risk to the extent of its fixed income investments and cash on deposit with financial institutions that earn interest at market rates. The Society manages its exposure to the interest rate risk of its cash by maximizing the interest income earned on excess funds while maintaining the liquidity necessary to conduct operations on a day-to-day basis. Fluctuations in market rates of interest on cash do not have a significant impact on the Society's results of operations.

The primary objective of the Society with respect to its fixed income investments is to ensure the security of principal amounts invested, provide for a high degree of liquidity, and achieve a satisfactory investment return.

14 Financial instruments continued

Market risk continued

Other price risk

Other price risk refers to the risk that the fair value of financial instruments or future cash flows associated with the instruments will fluctuate because of changes in market prices (other than those arising from currency risk or interest rate risk), whether those changes are caused by factors specific to the individual instrument or its issuer or factors affecting all similar instruments in the market.

The Society is exposed to other price risk because of its equity investments.

Changes in risk

There have been no significant changes in the Society's risk exposures from the prior year.

DORNER TELESCOPE MUSEUM

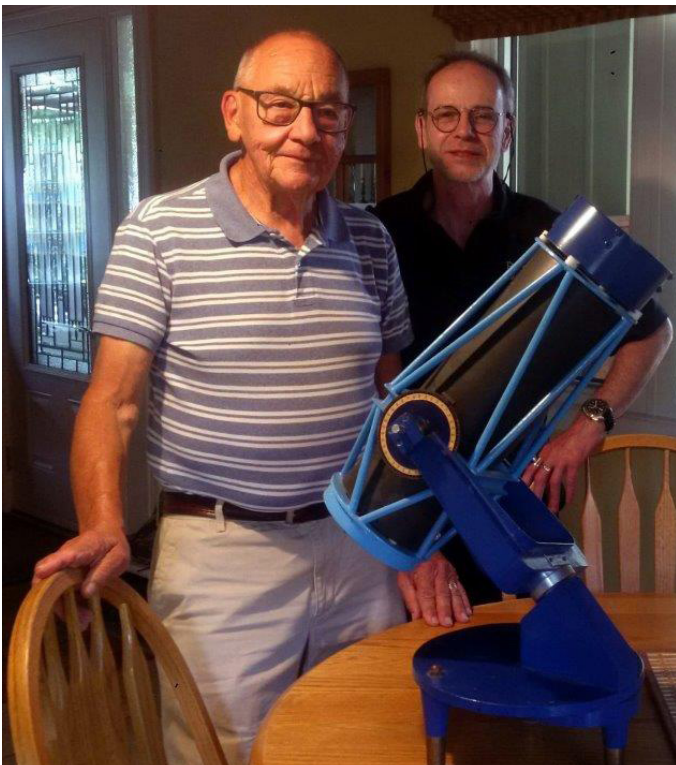
The Dorner Telescope Museum (DTM) has continued on the path to physical realization, despite the unexpectedly unusual conditions of the period covered by this report. The schedule for the DTM was advancing as envisioned, till March of 2020, when its course was unexpectedly and inexorably altered by the COVID-19 pandemic. In this it was no different than myriad other astronomical projects.

Beyond adapting a reasonably firm schedule to a new timeline with indeterminate dates dependent on factors beyond our control, trips to collect artifacts in person had to be drastically curtailed, and the program to conduct live oral history interviews with Canadian telescope makers was put on hold. More consequential was the cancellation of planned working trips to established telescope museums, or museums with substantial holdings of astronomical apparatus, to learn from their example when planning the DTM. The impact of this has been felt in the ongoing design process of the DTM, which nonetheless has forged ahead.

The collecting mandate of the DTM has continued throughout this period. A few of those acquisitions are illustrated here; a large Gregorian reflector from ca. 1750 by the leading British optician Francis Watkins, a 1895 Rowland grating by RASC honorary member John A. Brashear, a late-19th- early 20th-century achromatic refractor on a library stand signed Hearn & Harrison of Montréal, a Trippensee Planetarium (Canadian patent 1908) retailed by

George M. Hendry of Toronto, a 3-inch O.G. Dollond achromatic refractor ("Outlook" model) ca. 1910, with a Nova Scotia provenance, a late-19th- early 20th-century equatorially mounted Newtonian reflector (6-inch primary) with an association with Sir Frederick Banting, and the ca. 1969-1970 engineering model of the Ottawa Centre's Fred Lossing telescope (shown with Barry Matthews of the Ottawa Centre and the DTM Director, Randall Rosenfeld). We can only look forward to the time post-pandemic when the museum can welcome RASC members, and the public.

The following have very generously helped the DTM during this period, either with donations in kind, or expertise, or both. Before listing their names in grateful acknowledgement, one person has to be singled out for her oversized contribution. Jenna Hinds, the recently retired RASC Outreach Coordinator, went well beyond the call of duty in helping the nascent museum, in particular assisting with much of the demanding lifting and carting of artifacts, at considerable cost to her own free time. Her contribution is



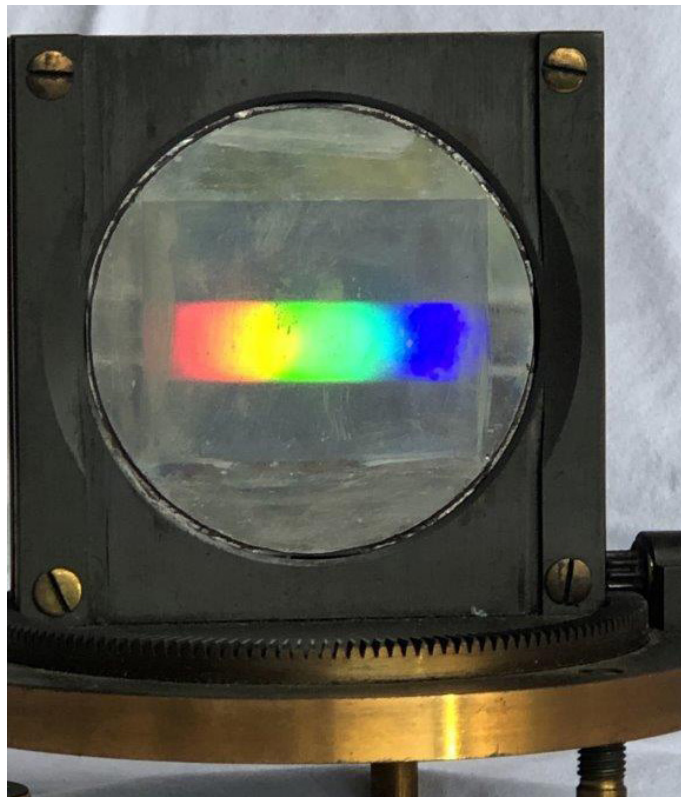
Engineering model of the RASC Ottawa Centre's Fred Lossing telescope, made in the labs of NRC, ca. 1969-1970, Ottawa (the original 4-inch primary mirror is missing; a replacement has been commissioned). The full-sized Fred Lossing telescope (16-inch primary, 1971-) was designed and made by Ottawa Centre members under the leadership of Dr. Fred Lossing, and it proved highly successful, being used to discover comets C/1978 H1 (Meier), C/1979 S1 (Meier), C/1980 V1 (Meier), C/1984 S1 (Meier), C/1989 Y1 (Skorichenko-George). The two figures with the telescope are Barry Matthews (Ottawa Centre) and the Director of the DTM, Randall Rosenfeld (DTM tba).



Unsigned, equatorially mounted Newtonian reflector, late-19th- early 20th century (the original 6-inch primary mirror is missing; a replacement has been commissioned). This beautifully made instrument has a provenance associating it with Sir Frederick Banting (1891-1941), one of Canada's first Nobel laureates (1923), although no other evidence has come to light that he had any interest in astronomy (DTM tba).



Hearn & Harrison of Montreal (ca. 1880–1930s) achromatic refractor on a library stand, late-19th- early 20th century. These small mounted achromats with object glasses (O.G.) ranging from 40 mm to 90 mm, could be found in amateur hands (DTM tba).



John A. Brashear (1840–1920) Rowland grating, Allegheny, Pennsylvania, 1895. “Uncle” John was an honorary member of the RASC, and these gratings were essential in the efflorescence of astrophysics at the time (DTM 20.202065).

much appreciated, and she will be missed.

DTM benefactors 2020–2021

- Randy Attwood FRASC (Mississauga Centre)
- A. Barbetta (Mississauga Centre)
- Dr. Roy Bishop, FRASC (Halifax Centre)
- Dr. Roger Ceragioli (ATS; Richard F. Caris Mirror Laboratory, University of Arizona)
- Dave Chapman FRASC (Halifax Centre)
- Prof. Ralph Chou (Toronto Centre)
- Prof. Umberto De Boni
- Brian Dernes (Kitchener-Waterloo Centre)
- Lisa Di Veto (RASC)
- Steve Dodson (Sudbury Centre)
- Rudolph Dörner (Kitchener-Waterloo Centre)
- Terry Doucet (Montréal Centre)
- James Edgar FRASC (Regina and Halifax Centres)
- Bart Fried (ATS)
- S. Graham
- Prof. Karim Jaffer (Montréal Centre)
- Shawn Lee (Toronto Centre)
- Walter MacDonald (Kingston Centre)
- Sandra Manning
- Barry Mathews, and the members of the Ottawa Centre
- Clark Muir (Kitchener-Waterloo Centre)
- Cliff Nordal (Toronto Centre)
- Dr. Arne Paysen (Denkmalpfleger, Schleswig-Holstein)
- Peter Pekur (Kitchener-Waterloo Centre)
- Dr. Sara J. Schechner FAAS (ATS; David P. Wheatland Curator of the Collection of Historical Scientific Instruments, Harvard University)
- Walter Stephani (ATS; Kiel, Germany)
- Alan Ward (Sudbury Centre)

R.A. Rosenfeld



Dollond achromatic refractor (“Outlook” model, 3-inch O.G.), ca. 1910, London. This instrument has a Nova Scotian provenance, and though primarily an instrument for marine or terrestrial use, it is nice to think that it could have been used for viewing the 1910 apparition of Halley’s Comet (1P/Halley) (DTM tba).



Trippensee (1905-) Planetarium, 1908 Canadian patent, retailed by George M. Hendry of Toronto (ca. 1912-1937). A fixture in some fortunate Canadian classrooms in the first half of the 20th century, these looked back to the mechanical astronomical models of the Enlightenment, and forward to the early electro-mechanical planetaria (DTM tba).



Francis Watkins (1723-1791) Gregorian reflector, London, ca. 1750. An instrument representative of those used on astronomical expeditions, and in observatories in 18th-century Canada (DTM 21.202065).

EDUCATION & PUBLIC OUTREACH—2021

Members of the Committee:

- Lauri Roche Victoria—Chair
- Kirsten Vanstone Toronto
- Karim Jaffer Montreal
- Lucas Kuhn Vancouver
- Krista Van Learhoven Yukon
- Ron Macnaughton Toronto
- Tony Schellinck Halifax
- Jo Ann Salci National
- Francesco Ambrogi Kingston
- Linda Pulliah (in memorium) Sudbury

National Office Staff Representatives: Phil Groff, Jenna Hinds, and Samantha Jewett

Board of Directors Representatives: Brendon Roy, Robyn Foret

The Education and Public Outreach Committee of the RASC consists of ten members from across Canada with Brendon Roy as Board Liaison and Phil Groff, Jenna Hinds, and Samantha Jewett as non-voting members from the National Office. Francesco Ambrogi has taken a leave for work reasons since September of 2021 and Linda Pulliah has recently passed away.

Meetings:

We held seven full committee meetings during 2021 and several other subcommittee meetings for specific projects. The Agendas and Minutes of those meetings are on the Volunteer Google Drive under EPO/ Meetings.

Budget: The budget given to the Board of Directors and approved for 2022 was \$10,700. The proposed budget is also in Google Drive under EPO/Budgets.

Projects

The EPO Committee for 2021 concentrated on four major projects.

1. School Astronomy Clubs

Ron Macnaughton and Lucas Kuhn continued to work on the framework and resources for setting up Astronomy Clubs in high schools. The goal is to have at least ten clubs up and running for September 2022. A School Resources webpage is now active www.rasc.ca/schoolclubs/Explore.pdf and there is an email for teachers and Centres to connect for information and resources: school-clubs@rasc.ca

2. Creation Station—Karim Jaffer, Kirsten Vanstone, Lauri Roche

This project was launched in April 2021. This space is dedicated to creations from children and youth aged 5 to 12 for drawings, paintings, cartoons and graphics, stories, and poems. We were looking to have a place for students to add the A for Arts in STEAM sciences curricula. Karim Jaffer and Jenna Hinds presented a compilation video with the submissions at the 2021 GA and we had a dedicated page in the Sept/Oct issue of SkyNews Magazine for some of the drawings. (Update 2022—we launched a second year of Creation Station in May, increasing the age requirement to 17 and adding in video, audio, and multimedia submissions.) www.rasc.ca/creationstation

3. Novice Observing Certificate—Linda Pulliah, Lucas Kuhn, Tony Schellinck, Francesco Ambrogi

This subcommittee has developed a two-level novice observers certification program for young people and new observers that can be done, initially, in one night, for instance, at a star party or with Cubs and Guides. For the second-level, observers can spend just a few nights in order to obtain a certificate for their successes. We are in collaboration with the NextGen Committee and the Observing Committee to make this an informal and easily accessible program. We are in the Beta-testing stage and look to have it launched sometime in the fall.

4. First Nation's Resources—Jenna Hinds, Christa Van Laerhoven, Lauri Roche, Jo Ann Salci

We are looking to collaborate with the I&D Committee and the National Outreach staff who are setting up First Nations Speakers Programs over the next year.

5. NOVA Program—Samantha Jewett, Jo Ann Salci, Lauri Roche

The EPO committee has supported first Jenna Hinds, and then Samantha Jewett, on the development of a basic and extra set of modules that can be used by Centres as a new observer's program over a series of 8 to 10 weeks. The fall of 2021 was dedicated to creating these modules and the initial testing of the program was completed in the spring of 2022.

Other Initiatives:

1. On-going Reports for National: Safety Checks for Volunteers—The initial report to the Board was sent in 2019. In 2021, the report went back to the Constitution Committee and to the National Council and is still being processed. (Update for 2022—A part of this proposal was integrated into the report given to the National Council in June 2022 as “Best Practices for EPO Volunteers.”)

2. EPO Representatives Meeting—A meeting of EPO Reps from the various Centres was held in February 2021 for discussion of Outreach and Inreach at Centres during the pandemic and how Virtual Meetings were being handled.

3. Collaboration with other Committees and Task Forces—Several members of the EPO committee were part of other Committees and Task Forces that were initiated in 2021.

a) Eclipse Task Force (2023 and 2024). Under the direction of Randy Attwood this task force was set up to help Centres prepare for the 2021 Annual Eclipse in northern Canada and the Annular and Total Eclipses in 2023 and 2024.

b) National Eclipse Education Committee—Lauri Roche is working with Julie Bolduc of Discover the Universe on a multi-provincial committee to plan for supporting school districts and teachers with educational resources for the upcoming eclipses.

c) The GA Working Group—Randy Attwood is leading this group that includes the EPO to review past GAs and research how best to proceed in the next few years for future GAs.

d) The 2022 GA Committee—The committee also supported the staff and volunteers to begin the process of planning for the 2022 GA.

With 2021 being another year under the pandemic, the EPO committee continued to work with the National Office staff and Centre reps to provide programming and initiatives that could help Centres and members as they waited for the world to open up again to in-person outreach.

As chair of the committee, I would like, again, to thank Jenna Hinds and Samantha Jewett who have been so supportive of our projects and to Phil Groff, Robyn Foret, and Brendon Roy for being there at the National level for consultation and advice. I am lucky to have such a dedicated and spirited group of volunteers from across the country to work with but saddened beyond words for the loss of Linda Pulliah just a few weeks ago. She was a friend, a colleague, a mentor, a force of nature and we will miss her dearly.

Lauri Roche

Chair, Education and Public Outreach Committee

HISTORY COMMITTEE ANNUAL REPORT—2021

- Clark Muir (Kitchener-Waterloo) Chair
- Randall Rosenfeld, FRASC (National Member), Vice-Chair
- Chris Beckett (National Member)
- Dr. Roy Bishop, FRASC (Halifax)
- Eric Briggs (Toronto)
- Peter Broughton, FRASC (Toronto)
- Dr. Karen Finstad (Ottawa)
- Dr. Chris Gainor (Victoria)
- Andrew Oakes (National Member)
- Dr. Mark Tovey (London)
- *Robyn Foret ex officio (President)
- *Dr. Philip Groff ex officio (Executive Director)

The chief corporate activity of the History Committee in the period covered by this report was the RASC History Committee Webinar Series. This was a new venture for the Committee, spurred by the constraints of trying to develop a program under pandemic conditions. As it turned out, the de rigueur communications technology for the times proved an effective medium for the project. The Zoom video conferencing platform allowed us to design the series to make the most of the potential to reach effortlessly beyond the RASC, and Canada. Our speakers were chosen for having done basic research on their topics, the topics were chosen for their intrinsic interest, and the temporal and geographic range of the material ran from Greco-Roman antiquity to the present, and traversed the Middle East to North America, and out to space. Only two of the seven sessions dealt specifically with the heritage of the RASC. The series was judged a success, and the sessions have been archived on the Society's YouTube channel, RASCANADA:

2020

October 26 R.A. Rosenfeld FRASC
["Mars Through the Eyes of the RASC"](https://www.youtube.com/watch?v=mn8L_ZsAcic&list=PLzou3EKq3ths24xNSqFpsWcV7FijuYO1&index=13&t=1s)
www.youtube.com/watch?v=mn8L_ZsAcic&list=PLzou3EKq3ths24xNSqFpsWcV7FijuYO1&index=13&t=1s

November 23 Prof. Dr. Klaus Brasch
["The Research Legacy of Lowell Observatory"](https://www.youtube.com/watch?v=TZVarrqCbd8&list=PLzou3EKq3ths24xNSqFpsWcV7FijuYO1&index=12&t=1s)
www.youtube.com/watch?v=TZVarrqCbd8&list=PLzou3EKq3ths24xNSqFpsWcV7FijuYO1&index=12&t=1s

December 18 Prof. Dr. Bradley E. Schaefer,
["Star of Bethlehem: the New Discoveries and Solution"](https://www.youtube.com/watch?v=RUaSQk3hdDc&list=PLzou3EKq3ths24xNSqFpsWcV7FijuYO1&index=11)
www.youtube.com/watch?v=RUaSQk3hdDc&list=PLzou3EKq3ths24xNSqFpsWcV7FijuYO1&index=11

2021

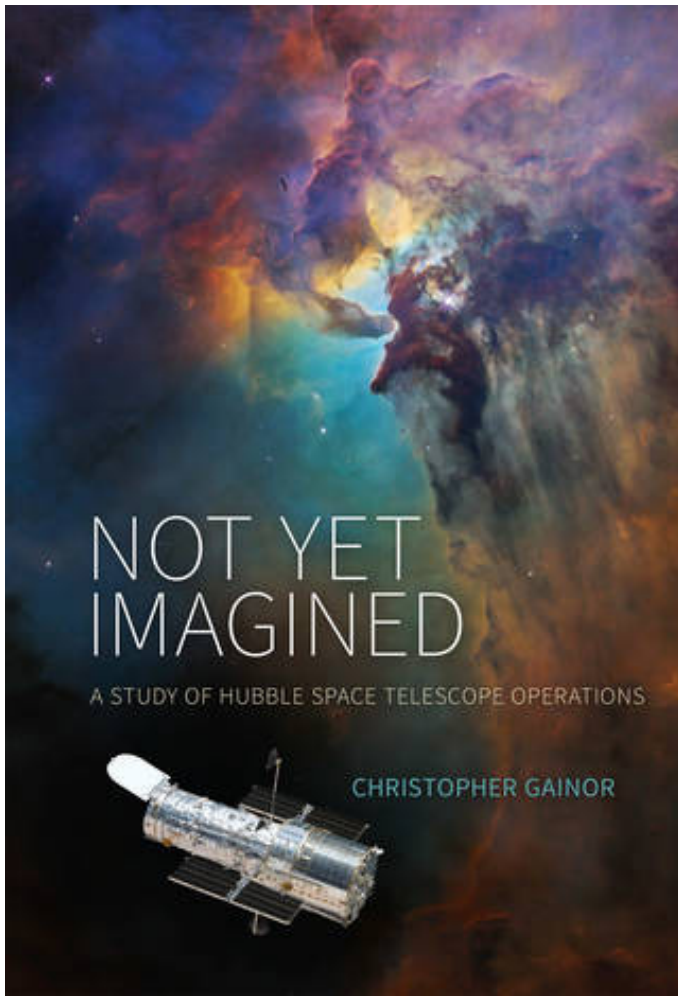
January 28 Peter Broughton FRASC,
["Should J.S. Plaskett be a Canadian Icon"](https://www.youtube.com/watch?v=wZyvHJa0ni0&list=PLzou3EKq3ths24xNSqFpsWcV7FijuYO1&index=14)
www.youtube.com/watch?v=wZyvHJa0ni0&list=PLzou3EKq3ths24xNSqFpsWcV7FijuYO1&index=14

March 2 Clark Muir,
["Murder at the Observatory: A Forgotten Chapter in the Legacy of Alvan Clark & Sons"](https://www.youtube.com/watch?v=EJvauf9PF1c&list=PLzou3EKq3ths24xNSqFpsWcV7FijuYO1&index=15)
www.youtube.com/watch?v=EJvauf9PF1c&list=PLzou3EKq3ths24xNSqFpsWcV7FijuYO1&index=15

RASC HISTORY COMMITTEE WEBINAR SERIES
Mars through the eyes of the RASC 2020 October 26

R. A. ROSENFELD

THE ROYAL ASTRONOMICAL SOCIETY OF CANADA / LA SOCIÉTÉ ROYALE D'ASTRONOMIE DU CANADA



April 6 John W. Briggs,
["A Walking Tour of Optical History—Artifacts and Anecdotes from the Astronomical Lyceum"](https://www.youtube.com/watch?v=zqb0uRhjSMk&list=PLzou3EKq3ths24xNSqFpsWcV7FjJuYO1&index=16&t=44s)
www.youtube.com/watch?v=zqb0uRhjSMk&list=PLzou3EKq3ths24xNSqFpsWcV7FjJuYO1&index=16&t=44s

May 20 Chris Gainor,
["Son of Hubble: Confessions of a Hubble Space Telescope Historian"](https://www.youtube.com/watch?v=ozuLcSwO530&list=PLzou3EKq3ths24xNSqFpsWcV7FjJuYO1&index=17&t=4911s)
www.youtube.com/watch?v=ozuLcSwO530&list=PLzou3EKq3ths24xNSqFpsWcV7FjJuYO1&index=17&t=4911s

Notable among the works published by Committee members are the following:

Peter Broughton FRASC,
 "Some Canadian Links to the Herschel family,"
 JRASC 114, 4 (2020 August), 161-167, 170-172

Christopher Gainor,
 Not Yet Imagined: A study of Hubble Space Telescope Operations (Washington, DC: National Aeronautics and Space Administration, Office of Communications, NASA History Division, 2020)—the official study of the HST in operation

Christopher Gainor,
 "Amateur Astronomers and the Hubble Space Telescope," JRASC 155, 3 (2021 June), 107-113

Clark Muir,
 "STEVE: A Look Back," JRASC 115, 5 (2021 October), 204-206—pre-discovery observations of STEVE with a Canadian connection

R.A. Rosenfeld FRASC,
 "Exploring the History of Colonialism and Astronomy in Canada," JRASC 115, 2 (2021 April), 89-95

R.A. Rosenfeld FRASC,
 "Exploring the History of Colonialism and Astronomy in Canada II: The Cases of the Slave-Owning Astronomer and the Black Astronomer Knighted by Queen Victoria," JRASC 115, 4 (2021 August), 172-178—these two papers are the first research papers on the subject

R.A. Rosenfeld FRASC,
 "J.F.W. DesBarres's Astronomical Instruments and the Castle Frederick Observatory: Fundamental Documents," JRASC 115, 6 (2021 December), 252-262

INCLUSIVITY & DIVERSITY COMMITTEE REPORT—2021

Current committee members:

- Roland Dechesne
- Robyn Foret
- Paul Heath
- Katrina Ince-Lum
- Noemi Vikki Zsohar
- Judy Sterner
- Charles Ennis
- Brenda Shaw
- Brian Lyonnais
- Simon Poole
- Bill Weir
- Katherine Dulong

- Virginia Rufina Marquez-Pacheco, Committee Chair
- Dr Philip Groff

Summary of Activities (2021)

World Asterisms Project

To begin, Charles Ennis has been working hard to produce a compilation of asterisms belonging to different cultures from around the world. As of 2021 March 21 (this is a long-term ongoing project), he had compiled 7327 asterisms from over 400 cultures around the world. This has been done through research and consultations with researchers from different countries and belonging to some of the cultures in question. The idea is to have this compilation be a living work that can be added to, as well as act as a source

of consultation. The release of this project is currently planned for 2022 June 1.

French Translations

The committee has been working with National Office to find funding to start translating our material to French. The long-term goal is to hire a translator and have as much RASC material as possible available in both official languages, English and French. This is an ongoing project.

Indigenous Astronomy Promotion

Roland Dechesne and Judy Sterner have been working on contacting Indigenous persons from the Blackfoot Nations in Alberta to work in partnership on the Indigenous star wheel. So far, Rob Cardinal has shown interest in working with us. He is Research Associate at the University of Calgary and the Executive Director of The First Light Initiative. This is an ongoing project.

Completed and Upcoming Activities (2022)

Black History Month Webinar

The first activity that we hosted this year was “To the Stars and Beyond: Celebrating Black History Month”. The event was held

as a celebration of Black excellence and an opportunity to learn about various peoples’ work. We invited Louise Edwards, Kevin Hewitt, and Diane Phillips to speak about their contributions to astronomy, astrophysics, and science education. The feedback from the event was overwhelmingly positive, especially on Zoom where most of the interactions from attendees occurred. The event was hosted on Zoom and livestreamed on YouTube, and it is still available for viewing on the RASCANADA YouTube channel.

Pride Month & Indigenous History Month

The Committee is currently working on hosting two events in June to celebrate Pride Month and Black History Month. More details on that to come.

The rest of the work being done mainly revolves around ongoing projects: asterism compilation, French translations, Indigenous astronomy, etc.

Virginia Rufina Marquez-Pacheco

Chair

LIGHT-POLLUTION ABATEMENT COMMITTEE—2021

Committee Membership

- Bob King, Chair (Calgary)
- Peter Brackett (Calgary)
- Roland Dechesne (Calgary)
- Robyn Foret, ex officio & Board Liaison (Calgary)
- Phil Groff, ex officio (National office, Toronto)
- Lauren Knowles, Environmental Outreach Coordinator (National)
- Victoria Kramkowski (Toronto)
- Chris Weadick (New Brunswick)

The committee membership underwent several significant changes this year. Over the year end, Richard Huziak (Saskatoon Centre) stepped down after serving for nine years on the committee to focus his efforts on light-pollution abatement (LPA) efforts in Saskatchewan. Robert Dick also stepped down after 22 years on the committee, serving as chair for many of those years. He too will continue his passionate fight against light pollution.

Victoria Kramkowski (Toronto) was appointed to the committee. Her professional background is in the environmental and climate-change field, with a focus on working in various governmental sectors, particularly municipal. Her skillset includes working with, and advocating to, various levels of government, as well as private landowners, community groups, and other organizations and agencies, and she is familiar with municipal and provincial legislation (in Ontario) related to land-use planning and environmental conservation and protection.

Nick Hammar supported the committee from January to July as Environmental Outreach Coordinator. In this role he provided key administrative support in dealing with our existing and prospective dark-sky preserves (DSP), nocturnal preserves, and urban star parks, as well as preparing content and modifying our Light-Pollution Abatement (LPA) website. He was succeeded by Lauren Knowles, who joined us in August 2021. Lauren is a conservation

education outreach specialist with strengths in content creation and communications and has experience with conservation societies and Parks Canada.

Discussion

During 2021, the national Light-Pollution Abatement Committee (NLPAC) continued its focus on revitalizing our dark-sky preservation program and on providing supportive resources and guidance for local light-pollution abatement efforts. The RASC’s dark-sky preservation program is intended to protect the nocturnal environment and it is an excellent communication channel through which to educate people, both directly and with partners. It also creates tourism and economic opportunities for property owners and DSP operators who wish to tap into the growing public interest in accessing the outdoors, including audiences who are interested in astronomical observing and nocturnal ecology. We have been re-engaging our DSP operators, and our LPA website was reorganized, and content was expanded and updated. The NLPAC also prepared material to support our DSP operators and RASC Centres. Progress on these and other goals during 2021 is summarised below.

- 1) Directional Priority: maintain extensive resources on LPA initiatives:
 - a) Update and reorganize the LPA website: Work to update and create dedicated webpages for each dark-sky preserve, nocturnal preserve, and urban star park continued as part of our commitment to promote DSPs. 19 of 26 are complete.
 - b) Public outreach & education:
 - i) Supported the RASC National Office’s creation of several videos that spoke of light-pollution abatement and a set of short TikTok videos, each of which featured a different RASC Dark-Sky place.

- ii) The number of followers of the @RASC_LPA twitter account increased by 24% to 6394 followers. The RASC's Dark-Sky Preserve Program Facebook page now has 827 followers, an increase of 36 followers over the previous year.
- 2) Directional Priority: liaison with the International Dark-Sky Association (IDA) and other LPA groups
- a) Participate in select conferences:
 - i) The [Éclat Lighting Initiative](#) conference was attended virtually. Conference recordings are available on the Éclat website.
 - ii) The United Nations/Spain/IAU Workshop on Dark and Quiet Skies for Science and Society was attended virtually. The high level program is available at [Dark and Quiet Skies for Science and Society II](#) and a list of links to the presentations is available through the RASC LPA Google drive: [Dark Sky Conf 2021-IAC a1.xlsx - Google Sheets](#).
 - iii) The NLPAC is indirectly connected to and supporting the Artificial Light at Night (ALAN) conference series, a biennial conference of ALAN researchers and select citizen scientists. The next ALAN conference will be co-hosted by the Calgary Centre and the University of Calgary in August 2023. Bob King and Roland Dechesne were appointed to the ALAN International Steering Committee, which establishes the conference content, and both are on the local organizing committee. While there is very limited opportunity for non-academics to attend in person, we will examine how the LPA leaders from Centres, and others, can attend virtually.
- 3) Directional Priority: LPA Certificate of Merit program
- a) In early 2021, the Board approved the NLPAC's recommendation to discontinue the LPA Certificate of Merit program since it had been unused since 2007. Shortly thereafter a person in Gravenhurst, Ontario, who we had been supporting to resolve a dispute between the Torrance Barrens DSP and Ontario Parks, asked us to recognize the Gravenhurst Canadian Tire store manager for extinguishing its lighting overnight. This individual wanted to use our certificate to thank the store manager and to support efforts to improve the local light-pollution by-law that in part helps protect the Torrance Barrens DSP. Going forward, the NLPAC will consider such requests and will create criteria that applications must meet to be considered and make a reformation to the Board to reinstate the Certificate of Merit program. It is intended that the program will be managed by the Environmental Outreach Coordinator.
- 4) Directional Priority: conduct research on current light-pollution levels
- a) A methodology to quantify light trespass using illuminance and luminance meters was developed and limits proposed. In 2022, these will be assessed for development into recommended practices for use by municipalities.
- 5) Directional Priority: sharing of strategies and techniques to effectively engage individuals, companies, and municipalities in adopting effective measures to reduce light pollution:
- a) New applications: In late 2020 we received an application for a new urban star park and in mid 2021 we received an application for a new nocturnal preserve (applications remain confidential until a recommendation is made to the Board). Both had deficiencies, and feedback was provided.
 - b) Operational support:
 - i) The McDonald Park DSP in Abbotsford, B.C., is suffering brightening skies due to residential and commercial growth in the adjacent area. Use of the DSP for observing and education has virtually ceased. We are working with the Fraser Valley Centre, which created the DSP in 2003, to re-engage the City of Abbotsford to help protect the DSP.
 - ii) A few DSP operators report having difficulty with some visitors who are concerned about the low light levels and a few visitors even attempt to alter lighting. DSP operators also feel somewhat unprepared to educate visitors about DSPs. In response, the committee drafted a leaflet that explains what a DPS is, and what to expect and how to support it while visiting. The DSP operator can hand it out to visitors and the text can be used to prepare on-site signage. This will be available for DSPs to use by Q2 2022.
 - c) Create a library of LP presentations: A PowerPoint presentation about the LPA committee and the DSP program is being prepared and will be distributed in early 2022 for all Centres to use. NLPAC members can be invited to present or support presenting the PowerPoint.
 - d) Compile a library of LPA by-laws: 31 by-laws from across the country have been collected and are now indexed in the [Canadian Lighting Bylaws & Policies](#) folder on the LPA website.
 - e) Greenhouse lighting: A document about the harms of uncontrolled greenhouse lighting and recommended solutions has been drafted and will be finalized in 2022. We expect it can be used by Centres and individuals to guide conversations with greenhouse owners, and municipalities developing regulations.

Budget

NLPAC Expenditures in 2021 were \$106.99 for registration to attend the ECLAT conference virtually.

Bob King,
Chair

NEXTGEN COMMITTEE—2021

- Chair: Émilie Lafèche, Montréal Centre
- Internal Officers: Aline Alcaraz, Montréal Centre
Ivan Tockovski, Toronto Centre
- Communications Directors: Aden Horbachewsky, Yukon Centre
Lucas Kuhn, Toronto Centre
- Equity and Diversity Coordinator: Amaya Senso, Montréal Centre
- Social Media Coordinator: Keegan Oickle, Halifax Centre
- Social Media Intern: Neerja Shah, Toronto Centre
- Treasurer: Meredith Miller, Vancouver Centre
- Board Liaison: Betty Robinson, Mississauga Centre
- Staff Liaison: Jenna Hinds, RASC National



Terms of Reference

The NextGen Committee's purpose is to address the needs of current and future RASC youth members (meaning members between 13 and 25 years of age, inclusive) as they relate to programs and services of the Society. The committee serves to represent the unique viewpoints, values, and experiences of the Society's youth members as they apply to their RASC membership, including a core dedication to upholding the ideals of respect, inclusivity, and diversity within the Society.

Accountability

The committee is accountable to the Board and reports directly to the Board a minimum of two times a year, or as required. The committee will supply copies of its plans, minutes, reports, and other documents to the Board upon request. The committee will provide an annual report to the National Council.

Authority

The committee has the authority to:

- Create, and ensure the maintenance of, an inclusive, safe, and respectful environment for all youth members within the Society;
- Promote and foster productive communication between youth members and their centers/the Board;
- Amplify, and diversify the representation of, youth voices at the RASC National level;
- Provide opportunities and funding (e.g., scholarships/bursaries) for youth members;
- Encourage and facilitate networking, mutual support, and the sharing of ideas between the Society's youth members;
- Promote the Society's STEM focus at youth-led and youth-focused external events, in collaboration with other committees such as the Education and Public Outreach, Robotic Telescope, Observing, Astro-Imaging, and History committees;
- Contribute to the social media presence and public outreach initiatives of the RASC by hosting Next Gen social media channels, which aim to showcase the contributions and involvement of youth members within the Society;
- Assist the Society Office's Youth Coordinator in the execution of approved programs targeting youth members.

2021 Project Summaries

1. NextGen Scholarship Program

In 2021, the NextGen Committee provided a total of \$1500 CAD worth of scholarships to 2 youth members in the Society. The \$1500 was split into two separate bursaries: the \$500 Community Leadership Fund (CLF) and the \$1000 Post-Secondary Scholarship (PSS).

The scholarship recipients were announced and awarded on June 25, 2021, during the RASC General Assembly Youth Day. The CLF recipient was Ananda Thomlinson of the RASC Kelowna Centre for her "Solar System Scavenger Hunt" project, which will be completed in 2022. The PSS recipient was Willow Benitz of the RASC Vancouver Centre, a Physics and Astronomy undergraduate student at UBC who has used her award to fund the final year of her degree.

2. Passport to the Universe (PTTU)

The NextGen Committee continues its work on the PTTU, a project that aims to complement the current youth membership cards with a ~20-page, passport-sized booklet that will serve as a young RASC member's interactive introduction to the RASC community and to observing the night sky.

The Passport to the Universe concept was conceived with the purpose of creating a fun, innovative way to attract youth members to the RASC and providing them with a tool/portfolio that may act as a replacement for the current membership card to encourage and track their engagement and development throughout their years in the RASC.

The PTTU will offer a French and English version, as our Committee believes that the inclusivity of both national languages is necessary if we are to be aligned with our principles on diversity and inclusion.

The passport's first couple of pages will contain a message from the National Office, a message from the NextGen Committee, and a place to fill in all membership information before mailing it out. The goal of this passport is to spark an interest in observing at an early age and provide youth with a physical item that connects them to the Society and other youth members. All decisions about this passport regarding observing goals will be approved first by the Observing Committee, and thus are subject to change.

3. RASC General Census

Initially, the General Census began as a survey for youth members, but through collaboration with the Diversity and Inclusivity Committee and others, the project developed into a Census to be sent out to every member of the Society.

The Census was made available to all members in the Society through an anonymous Google Forms survey. Young minors were encouraged to have a trusted adult fill out the Census on their behalf. Incentives in the form of raffle prizes were used to encourage members to participate in the Census. Around 200 members filled out the Census, which was a lower number than originally hoped for, but considered a good outcome for the first attempt at this kind of Society-wide survey.

The resulting data is currently being analyzed by the NextGen Committee and the I&D Committee collaboratively, and the results will be presented in a report which will be shared with the other committees to use for their reference. Our Committee will use the data to continue development on our projects centered around community outreach.

Based on its reception this past year, the General Census has plans to become a regular project that will be improved and expanded over the years as a cross-committee collaboration.

4. NextGen Merchandise

For the first round of merchandise designs, launched in time for the RASC General Assembly (GA) Youth Day 2021, NextGen released T-shirts with the Committee logo on them, as well as one GA-exclusive T-shirt design to commemorate the first-ever GA Youth Day. Free stickers with this exclusive design were sent as thank-you gifts to Youth Day presenters, organizers, and volunteers.

Moving forward, the Committee will continue to design new, NextGen-branded merchandise for sale to youth and all other members of the RASC. The Committee has plans to take on a new volunteer for this project in 2022, whose role as Merchandise Intern will entail designing new NextGen merch and working with the National Office to launch them on the RASC online store.

5. Youth Day—General Assembly

On June 25, 2021, the NextGen Committee hosted the first-ever General Assembly Youth Day, which featured a day's worth of guest speakers, workshops, and networking opportunities. This event, as with the rest of the 2021 General Assembly, was very well-received by attendees, and based on this community feedback, Youth Day will become an annual fixture in future GA planning, led by the NextGen Committee.

6. NextGen Social Media Initiative

The NextGen Social Media Initiative was started by the previous RASC Youth Committee with the goal of making content that highlights, engages, and educates youth members of the RASC. The NextGen Committee aims to take what was started with the Social Media Initiative and improve it by making the content more consistent and professional.

There are a few different types of posts that are posted every month. The monthly Youth Member Recognition series is meant to highlight the contributions to astrophotography, community engagement, and other astronomy-related projects that youth members are undertaking within the RASC. Event promotion posts are posted when needed to promote upcoming events. The Intergalactic Inquiries series involves bi-monthly posts that answer commonly asked astronomy questions, which are sometimes sourced from Q&As held on our Instagram Stories. The Space Scoop series includes bi-monthly posts that can report on a variety of current topics, including "What's in the Sky?" (at the start of each month) observation challenges, upcoming astronomical events, space exploration mission achievements and updates, Canadian research spotlights, amateur astronomy tips, and international awareness days.

7. NextGen Web Content

The new NextGen Web Page was initiated in November 2021. Web content for this page will be worked on further in 2022, as we have assigned Committee member Aden Horbachewsky to the role of Webmaster for NextGen.

8. NGC 2021 Internal Election

The NextGen Committee held its first Internal Election from December 6-12, 2021. This election, held anonymously on Google

Forms, served as a means for then-current NextGen Committee members to re-elect their peers, as well as elect new youth members who applied for specific roles on the NextGen Committee, to available committee positions in 2022. The results of the elections, which were voted on unanimously, were as follows:

- Aline Alcaraz—Chair
- Aden Horbachewsky—Treasurer
- Ivan Tockovski, Keegan Oickle, Warsha Mushtaq—Internal Officers
- Lucas Kuhn—Communications Director
- Disha Patel—Events Coordinator

As per the election results, the individuals listed above form the NextGen Committee in 2022. The role of Equity and Diversity Commissioner was retired this year, as our ongoing collaborations with the Inclusivity and Diversity Committee have fulfilled the initial goals we intended for this position (namely, holding us accountable in our various project undertakings and ensuring that we uphold equitable and inclusive committee practices). Moreover, the responsibilities of the previous role of Social Media Coordinator have been absorbed by the existing role of Communications Director. The 2022 NGC Role Mandates, drafted by each committee member, reflect the new responsibilities and goals of each position on the committee for the upcoming year.

9. Committee Testimonials/Role Descriptions

A number of Committee members have provided short descriptions of their personal contributions to the NextGen Committee in 2021. These are as follows:

"Over the past year, Aden Horbachewsky has been one of the two Communication directors on the NextGen Committee. In this position, Aden has had the responsibility of checking the NextGen email and relaying messages to the rest of the board, and also dealing with an aspect of the NextGen socials planning. Aden, with the rest of the committee, helped plan and facilitate the youth day at the RASC General Assembly. This included helping plan the day's events and Gather Town meeting place. Finally, with the rest of the committee, Aden reviewed the applications to pick recipients of the NextGen Post-Secondary Scholarship and Community Leadership Fund."—Aden Horbachewsky

"The role of Director of Communications was previously divided into two individual sub-roles: the Communications Director: Committee Relations and the Communications Director: Member Relations (note, for the following year, these two roles will be combined into one). During the 2020/2021 year, the Director of Communications—Committee Relations (DC-CR) for the NextGen RASC Committee oversaw all of the committee's communication-related tasks with the primary purpose of establishing and maintaining communication between the NextGen committee and all other relevant parties, be it in or outside of the RASC.

Some of the larger contributions of the DC-CR to NextGen from the past year include the following. The DC-CR maintained communication between the RASC NextGen Committee and the RASC EPO Committee regarding projects with relevant overlap such as NextGen's "Passport to the Universe" and EPO's "Beginners Certificate for Observing". The DC-CR consistently monitored the RASC NextGen email and responded to emails on behalf of the committee accordingly. The DC-CR organized and executed monthly committee-wide socials meetings which involved delegating content creation for the committee's social media platforms (note, during the following year, the responsibility of posting the social media content for the committee will also fall under the role of DC-CR). Finally, the DC-CR assisted in other internal committee projects including but not limited to the "Passport to the Universe", the website design, and the "Project Payload".—Lucas Kuhn

“The Treasurer of the NextGen Committee has worked hard to organize and manage the 2021 budget. In the 2021 annual budget request, \$4,487 was requested by the NextGen Committee, and the year ended under budget by more than \$1000. The first year of the NextGen Post-Secondary Scholarship and Community Leadership Fund was very successful, providing a total of \$1,500 worth of funding to two Canadian youth. The 2021 General Assembly (GA) was a large portion of the expenditures this year, but it was a very

successful virtual event, with almost the entire youth day spent on Gathertown. NextGen was also able to design and create the first line of merchandise, including T-shirts and stickers for the 2021 GA. Overall, the 2021 fiscal year went smoothly, with the NextGen budget going towards community engagement, merchandise, and funding for Canadian youth.”—Meredith Miller

Émilie Laflèche
Committee Chair

OBSERVING COMMITTEE—2021

Summary

We blew the doors off 2020! To put it another way, we greatly surpassed the awarded certificates from 2020. The Observing Committee was thrilled to receive and approve 68 visual observing certificates in the calendar year 2021!

We were also pleased to award the first certificates for the new RASC Double Stars program.

There was a changing of the guard in the committee with the past chair stepping down and an interim chair filling in.

We reconciled the records of certificates awarded.

There was considerable upheaval at the national office and we noted errors and delays in certificate printing and delivery. We worked the problems and felt, by year's end, we closed most matters. We are very grateful to Samantha Jewett for a big push in December 2021, between the office move and the Christmas break.

The committee is in good shape and we're looking forward to the new year.

Observing Programs

The RASC national Observing Committee oversees eight visual observing certificate programs, nine if you count the sub-types for the ETM. See rasc.ca/certificate-programs for more information.

- 1. Explore the Universe (ETU) [with pin] (the only program open to the public)

- 2. Explore the Moon (ETM)
 - a. Binoculars (ETM-B)
 - b. Telescope (ETM-T) [with pin]
- 3. Messier Catalogue [with pin]
- 4. Finest NGC Objects (FNGC) [with pin]
- 5. Double Stars
- 6. Isabel Williamson Lunar Observing Program (IWLOP) [with pin]
- 7. Deep-Sky Gems (DSG)
- 8. Deep-Sky Challenge (DSC)

The first program launched, of course, was the Messier Catalogue back in 1981 with the Finest NGC Objects program starting up in 1995. The beginner, sampler program, Explore the Universe started in 2002 and remains quite popular. The Explore the Moon programs joined the ranks in 2016 and we've seen increased interest in these of late. The newest program is for double star and multi-star systems and it was made available in the fall of 2020 (rasc.ca/double-stars).

Blake Nancarrow did a deep dive (no pun intended) into the Deep-Sky Gems observing program, encountering a number of issues in the Observer's Handbook and the program proper. A few corrections and updates were made after discussions with James Edgar (editor), David Levy (program champion who also channelled the late Leo Enright), and supportive member Michael Stephens. A key concern was accommodating the target list changes over the years. The Observing Committee emphasizes that any member

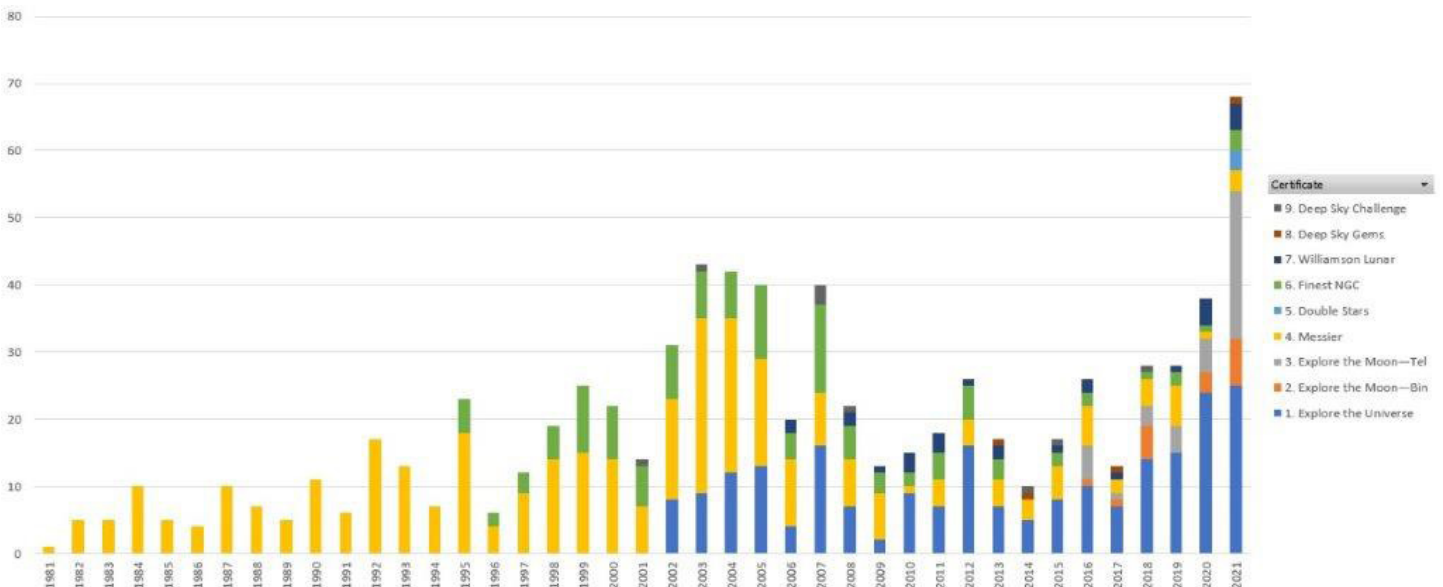


Figure 1. Certificates issued by year.

working the program will be recognized for their efforts with respect to the program target list they initially obtained.

The Observing Committee added clarifying messaging to all our program pages to remind observers that earning a certificate is an individual effort.

The Observing Committee emphasized that an observation is a brief log note and/or an annotated sketch. Photos may be included in submissions, but logging/sketching must be done from an eyepiece.

We provided additional files for download for observers seeking to load electronic observing lists into their favourite astronomy programs. For example, we deployed Excel, SkyTools, Stellarium, and SkySafari lists for the FNGC program.

Certificate Recipients

We processed the following 68 certifications in 2021. Listed in reverse chronological order.

- FNGC, Chris Vaughan, Toronto, Dec
- ETU, Andrew Godefroy, Kingston, Dec
- ETU, Curtis Breslin, Ottawa, Dec
- Double Stars, Chris Vaughan, Toronto, Dec
- ETU, Matt Stroh, National, Dec
- FNGC, Mike Matwyuk, Prince George, Dec
- ETU, Jeanette Kenny, Halifax, Nov
- ETM-B, Milad Shenno, London (based in Egypt), Nov
- IWLOP, Mark Force, Okanagan, Nov
- Messier, Michael Wright, Kitchener-Waterloo, Oct
- Messier, Eric Klaszus, Calgary, Oct
- ETU, Jeff Leger, New Brunswick, Oct
- ETU, James Rowan, Public (Plymouth, MN), Oct
- Double Stars, Frank Dempsey, Toronto, Sep
- ETM-T, Pat Seilis, Prince George, Sep
- ETU, Nishat Khan, National (Maple ON), Sep
- ETM-T, Margaret Childs, Winnipeg, Sep
- Double Stars, Melody Hamilton, Halifax, Sep
- ETM-T, Brian Parsons, London, Sep
- ETM-T, Nicole Laporte, Montreal, Sep
- ETM-B, Ross Ens, Vancouver, Sep
- ETU, Yolanda Kippers, New Brunswick, Aug
- ETU, Brian Barber, Victoria, Aug
- ETM-T, Swapna Shrivastava, Mississauga, Aug
- ETM-B, Liz Greenough, Halifax, Aug

- ETM-B, Melody Hamilton, Halifax, Aug
- ETM-T, Kevin Dromereski, Winnipeg, Jul
- ETM-T, Corrine Robinson, Winnipeg, Jul
- ETU, Jeff Carabott, Public (Whitby), Jul
- IWLOP, Darnell Ogrodnick, Regina, Jul
- ETM-T, Pedro Aloise, Victoria, Jun
- ETM-T, Christopher Purse, Victoria, Jun
- ETM-T, Christine Purse, Victoria, Jun
- ETU, Zachariah Kenney, Public (Montreal), Jun
- ETU, Dave Anderson, Ottawa, Jun
- ETU, Pat Seilis, Prince George, Jun
- ETM-T, Liz Greenough Halifax, Jun
- IWLOP, Charles Ennis, Sunshine Coast, Jun
- ETU, Ronald Puddister, Public (Kingston), Jun
- ETM-T, Jill Sinkwich, Victoria, Jun
- ETU, Matteo Statti, Mississauga, Jun
- ETM-T, Judy Black, Halifax, May
- Messier, Frank Dempsey, Toronto, May
- ETM-T, Richard Weatherston, Toronto, May
- ETU, Colin Urbaniak, Public (London), May
- DSG, Emile Cormier Jr., New Brunswick
- ETM-B, Abby Choi, Vancouver, May
- ETU, Christopher Purse, Victoria, Apr 2021
- ETU, Ross Ens, Vancouver, Apr
- ETU, John Crawford, Toronto, Apr
- ETM-T, John Crawford, Toronto, Apr
- ETM-T, John Read, Halifax, Apr
- ETM-T, David Hoskin, Halifax, Apr
- ETM-T, Ian Bain, Toronto, Mar
- ETM-B, Susan Hart, St. John's, Mar
- FNGC, Emile Cormier Jr., New Brunswick, Mar
- ETU, Linda Pulliah, Sudbury, Mar
- ETM-T, Harry Andinda, National (Uganda), Mar
- ETM-T, Lisa Ann Fanning, Halifax (New Jersey), Feb
- ETU, Pedro Aloise, Victoria, Feb
- ETM-T, Simon Poole, Calgary, Feb
- ETU, Dave Gillingham, Sudbury, Feb
- ETM-T, Murray Hunt, Edmonton, Feb
- IWLOP, Randy Enkin, Victoria, Jan
- ETU, Jill Sinkwich, Victoria, Jan
- ETU, Vitor Rodrigues (Zanata) da Silva, Public (Brazil), Jan
- ETU, Max A. Alpizar Durán, National (Costa Rica), Jan
- ETM-B, Alexandre Viau, Centre francophone de Montréal, Jan

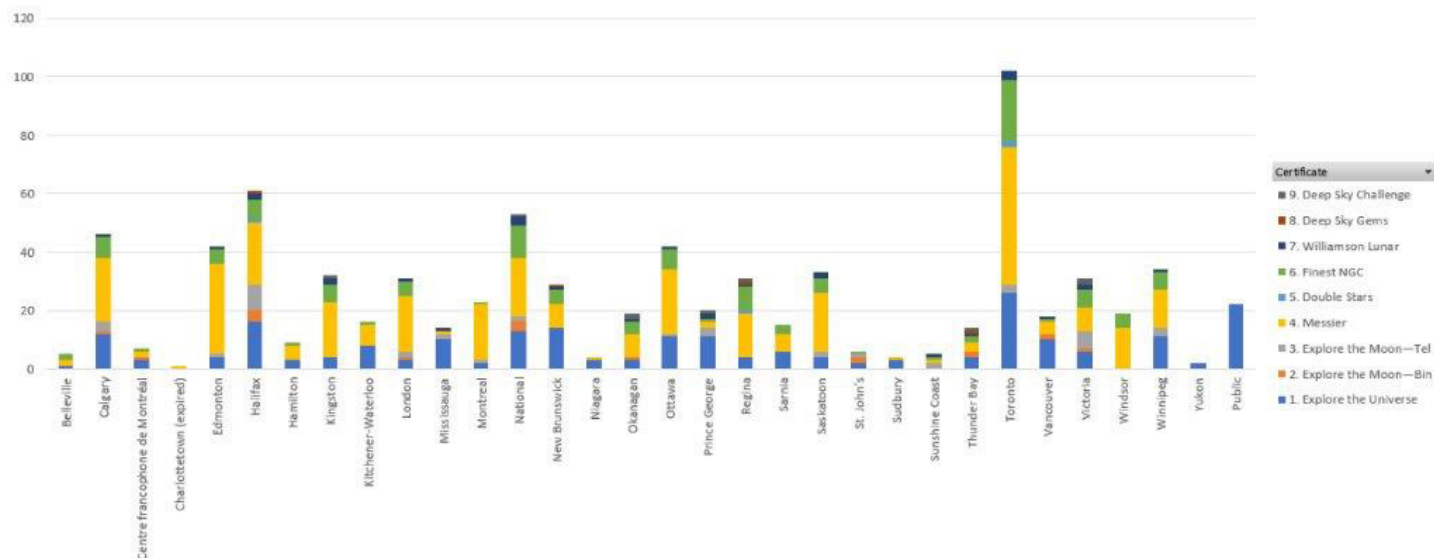


Figure 2. Certificates issued by Centre.

Notably, Melody Hamilton remains our most decorated observer! Melody also is the first RASC member to be awarded the new Double Stars certificate.

Chris Vaughan is tied for third place, holding five RASC certificates. He says he's working on other programs, which will elevate him to second spot on the podium.

Special recognition is due to Mark Force, Darnell Ogrodnick, Charles Ennis, and Randy Enkin for completing the challenging Isabel Williamson Lunar Observing Program.

Congratulations to all! Well done. You kept us busy but we enjoyed receiving every application. Keep on looking up.

The Team

The Observing Committee for 2021 was comprised of Dale Armstrong (London), Chris Beckett (National, Regina), Dr. Randy Boddam (Belleville), Dave Chapman (Halifax), Charles Ennis (Sunshine Coast), Melody Hamilton (Halifax), Roger Hill (Hamilton, Kingston), Malhar Kendurkar (Prince George), Bruce McCurdy (Edmonton), Blake Nancarrow (Toronto, National at the time of reporting), Murray Paulson (Edmonton), Karol Socander (Kitchener-Waterloo), Blair Stunder (Prince George), Jo Vandendool (Mississauga), Bill Weir (Victoria), and Vikki Zsohar (Yukon).

Malhar Kendurkar joined the committee as the national board representative liaison in the middle of the calendar year, taking over from Charles Ennis. We thanked Ennis for his past rep support.

Karol Socander rejoined the committee after Nancarrow reached out in June.

Vikki Zsohar left the committee after many years of assistance. We thank her for her contributions and relayed we were sad to see her go.

Blair Stunder resigned as the Chair of the Observing Committee in May. We thanked Stunder for his many years of service and support. Dave Chapman nominated Nancarrow as interim Chair. President Robyn Foret formally asked Nancarrow if he'd assume the post as interim Chair and provided the RASC Policy Manual. After discussions with Beckett and Chapman, Nancarrow agreed to accept the assignment. The RASC board approved the new Chair in late May. In June, the prime email for the department, observing@rasc.ca, was redirected to Nancarrow, and he received all relevant matters from Stunder. He provided an electronic version of his signature for use on the observing certificate.

While Nancarrow had communicated with a number of the team members over his years on the committee (since 2014), he wanted to touch base with all. He messaged and telephoned all members directly. Nancarrow attempted to arrange a meeting (virtually) to put faces to names but difficulties in scheduling prevented this in the calendar year; and it was deferred to 2022.

Nancarrow also reached out to all volunteers on the Local Certification Centres list to seek their continued support. He checked to see if Centres had any inventory of certificate sheets and pins.

Nancarrow worked closely with staff at national office to issue printed certificates (and lapel pins where applicable) to observers. He trained staff on overall processes, workflow, and advocated improved email handling. He developed a detailed swim-lane flowchart as a visual aid to processing certificates in order to help streamline the existing process. With staff turnover, this was rather challenging. He also trained staff on proper mailing address standards, as required by Canada Post, so to realize efficiencies, decreased delays, and reduced loss. He pushed for more robust packaging to minimize loss in mailing and shipping. He co-developed a tracking-ticket system and a certificate review process.

Committee members were active, helpful, and cheerful through the year. It is a great team in a healthy state.

Promotion

We increased awareness of our new Double Stars program by a couple of means. Chapman arranged for adding annotations to the existing promotional YouTube videos. Nancarrow submitted a piece in his Binary Universe column in the Journal, Volume 115, Number 2, April 2021, pg. 81. Chris Beckett and Shane Ludtke mentioned the new Double Stars program in their Actual Astronomy Podcast. Nancarrow arranged for a promotional info card for the RASC home page to be implemented in the future.

Some members learning of our Double Stars program took interest and undertook the campaign. By the end of 2021, three RASCals submitted completed log books and were certified.

In 2020, Jenna Hinds et al. launched a series of webinars discussing the Explore the Universe program, which created a good deal of interest and contributed to the overall increase in issued certificates for that year (38 total, 24 ETU). Residuals carried over into this reporting period with 25 ETU certificates awarded.

The RASC offered more webinars in 2021, this time focusing on the Moon. Jenna Hinds, John Read, and Samantha Jewett met and discussed targets, while Samantha sketched a lunar feature. Chapman and Nancarrow consulted with the team to co-present and ensure consistent messaging. These efforts account for the tremendous uptick in ETM certificates awarded, 7 for the Binoculars variant and 22 for the Telescope (whereas 2020 was 3 and 5 respectively). The Observing Committee was very happy with this positive and measurable impact. We are grateful for their work and enthusiasm.

John Read developed his new Messier book in 2021. He welcomed input from Nancarrow. We appreciate his reference to and support of the RASC observing certificate program.

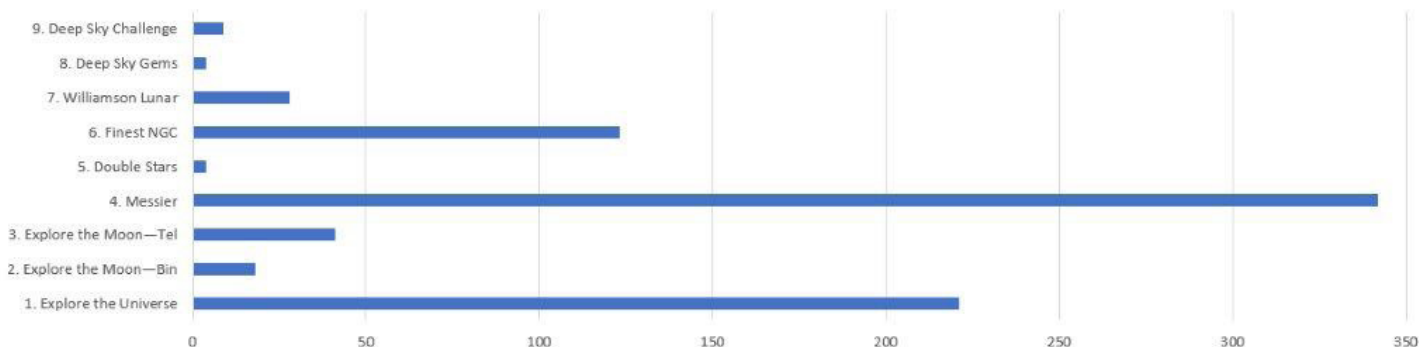


Figure 3. Certificates issued by type.

After an introduction with Reem Khalifeh, Nancarrow resumed periodic articles in the monthly RASC Bulletin. We thank Ted Dunphy for providing updated images for inclusion in printed, web, and presentation media.

Nancarrow was asked by *SkyNews* chief editor Allendria Brunjes to submit a piece on the RASC observing programs. We were thrilled to transmit our message to all Canadians.

Nancarrow was invited by Paul Dopson of the Sarnia Centre to present on the national observing programs (did you know Sarnia has the highest number of certificates per capita?). In December, he received an invitation from Luca Vanzella to speak to the Edmonton Centre. Nancarrow is available to present to any Centre looking to inspire their members to observe.

We all must have done something right because in July 2021, we surpassed the records for the highest numbers of certificates awarded in a calendar year. A little over half-way through the calendar, we knew we were on our way to a stunning year of visual-observing activity.

Certificates Analyzed

We processed 68 certificates for the year!

When we examine the bar chart (figure 1) showing certificates issued by calendar year, we can see an upward trend from a low in 2017. The RASC webinars in 2020 and 2021 must be contributing to increased interest, along with the launch of our brief YouTube videos.

The previous record high was 2003. The years 2003, 2004, 2005, and 2007 represented the top three quantities. But 2021 almost doubled them. It seems the pandemic did not hurt and that people needed new projects to focus on.

2021 shows the highest number of ETU, ETM-B, and ETM-T certificates ever awarded. It also shows the highest number of FNGCs since 2012. The pale blue is the new Double Stars program with 3 awards.

The bar graph by Centre (figure 2) shows the geographical distribution of certificates awarded across the country. Note the final bar at the right shows ETUs submitted by non-members. Of course, large Centres will accumulate more certificates.

Toronto leads the way at just under 100 certificates; Halifax stands on the second tier at just over 60. The third spot on the podium is held by members not affiliated with a particular Centre. After that are Calgary and Ottawa.

Our final bar chart indicates the total number of certificates awarded by type.

Messier, due to longevity and continued interest, is nearing 350. At number two, the Explore the Universe has had impressive uptake, and is now over 220 issued certificates. The new Double Stars program is on the map and will likely surpass the Deep-Sky Gems, maybe even the Deep-Sky Challenge, in the new year.

Quick math in your head will show we are nearing 800 awards in total.

Other Matters

The RASC switched to the new forum tool. While the old listserv was long in the tooth and had its own problems, the new system was not without issues. Communications in our committee were impacted greatly, with a number of committee members disabling forwarding to their email service. We bemoaned the lack of a daily digest. For critical messaging, we used direct email along with forum posts.

In the transfer of materials from the old to new chairperson, Nancarrow endeavoured to make a full and proper accounting of

certificates issued in the past, as well as pending ones. Previous chairs had alternately relied on the online web page recipient entries and an Excel workbook file, but Nancarrow found errors and inconsistencies in both. An expert in data management and spreadsheets, he reconciled the data over the summer and fall of 2021 and resolved all problems. He also enhanced the file for improved tracking and auditing for new certificates. He created Pivot Tables and effective charts to visually represent the trends and patterns in the data.

With an updated database, Nancarrow followed up with all recent certificate applicants to ensure receipt of a printed certificate (without physical damage) and proper spelling (and metal lapel pin where relevant). Notably, we successfully tracked down missing materials for our observer in Uganda and we hand-delivered a terribly-delayed ETU certificate and pin to a youth in London, Ontario, in front of beaming parents. We hope to have inspired a new, life-long relationship with the RASC.

Log book handling was reviewed. In transferring from the past to current chair, it was noted that the mailing address used for sending log books was the active chairperson. It was decided to switch from that individual to the National Office to add a degree of consistency to processing, particularly for future changes in the team lead. National Office staff graciously agreed to the imposition of scanning incoming materials. The emailing of large attachments was examined by Nancarrow and he suggested to all that we use online sharing resources, shared file services such as Google Drive, Dropbox, iCloud, OneDrive, etc. Observers applying for a certificate were asked to use their own service, if available. Nancarrow arranged that National Office provide a folder space on the internet to allow any applicant to upload their materials. This new Uploader Service was deployed, tested by Observing Committee volunteers, and found to work well for Windows, Mac, and Linux platforms. The Uploader Service is available upon request. All this simplifies and speeds the reception of log books, notes, sketches, etc. related to an observing certificate application.

Special Observing Recognition

The RASC national Observing Committee has always recognized the efforts of members pursuing observing programs within RASC Centres (by way of example, Montréal has its unique Double Stars programs designed by Carl Jorgensen). As well, we do maintain a record of Astronomical League observing certificates achieved by RASC members.

Nancarrow, in his new role, is looking to better monitor and track what RASCals are doing, but he currently knows of the following people (living and dead, in no particular order) having AL certificates.

Alexander Dutkewych, Bernard Venasse, Chris T. Adamson, Darrell Chatfield, Fr. Lucian J. Kemble, Frank Dempsey, Gaston Leu, Geoff Gaherty, George Guest, Gilbert Raineault, Jill Sinkwich, Jnani Cevvel, José C. Ordenes, Lynn Chetwynd, Mark A. Croom, Melody Hamilton, Michael K. Holzer, Nelson Walker, Nora-Jean Chetnik, Paul H. Bock Jr., Ray Berg, Richard Huziak, Richard I. Adduci, Scott Wilson, Tenho Tuomi, Terrill Bartlett, Tom Cameron, Tom Luton, and Vance Petriew.

If you're pursuing or have completed a visual observing certificate from another astronomical organization on planet Earth, please let us know.

Budget

In September, the committee received a request from Kendurkar to prepare a budget. Nancarrow reviewed past documentation and assembled a budget for committee review, and clarified to Kendurkar that we operate as a cost Centre with no direct income. While this committee shares resources with other committees and

National Office activities, we considered the cost per person for producing and shipping a certificate (sometimes with a pin). We took inventory at the time to anticipate reordering supplies. We also advocated for the use of a new, sturdy, robust mailer to prevent certificates from being folded during shipping. We asked for funding to produce new pins for the Double Stars program, assuming there will be considerable interest. The proposed \$1000 budget amount was approved. If we do order pins, we intend to dovetail into other orders to realize some economies and reduce costs.

Outlook

The Observing Committee regularly considers new observing programs. Our mantra is to get members observing (and get the general public exploring the Universe). We often ruminate on what can create more visual observing opportunities. Ennis, in developing his world-wide asterism list, suggested an associated observing program. We added his wish to the list of many other excellent ideas. Program development and deployment is a non-trivial process. For example, the Double Stars program took some 8 to 9 years from ideation to launching a detailed web page with files ready for members to download.

In 2020, the Observing Committee expected to break records in 2021. This proved true. That is ultimately a testament to the members, the proactive visual observers keen to undertake our programs and tick all those boxes and make their log notes and sketches. We are very proud of you all. It made for a busy year and overloaded us at times, but it is why we exist. Thanks for keepin' us busy.

Your national Observing Committee is committed to continuous improvement.

What does 2022 hold in terms of observing certificates? The bar is pretty high now, but we do hope that members will continue to tackle our projects. We'll keep beating the drum.

On a personal note, the chair, Nancarrow, is excited to open a new log book for entries for the Deep-Sky Gems.

Onward and upwards.

Colophon

Notes, facts, and figures assembled by Nancarrow in Evernote. He drew from committee documentation, the Excel "database," and Observing Committee emails. Data was manipulated in Excel to produce the charts. Content migrated to MS Word for the formal report. Output to PDF.

Images prepared separately in high resolution and saved as PNGs for use in the InDesign app for the preparation of the board reports.

Apologies for errors and omissions. Please submit corrections, additions, and requests for deletions to the author.

Assembled by Blake Nancarrow (blaken@computer-ease.com).

Blake Nancarrow

Observing Committee Chair

RASC 2024 TOTAL ECLIPSE TASK FORCE

The 2024 Total Solar Eclipse Task Force was formed in March 2020 and has the following objectives:

- 1) to produce and distribute information to the general public on observing the eclipses (both the 2023 Annular and 2024 Total), with the emphasis on safely and correcting disinformation.
- 2) to provide information to municipalities along the 2024 total eclipse path to help them prepare for the eclipse, using data and lessons learned from the 2017 TSE.
- 3) to provide information and support materials to RASC centres, not just those along or near the eclipse path, but across the country.
- 4) to build an information network to supply information and contacts to the media.

Randy Attwood

Chair

GENERAL ASSEMBLIES WORKING GROUP

The mandate of the RASC General Assemblies Working Group is the following:

- 1) A working group has been formed by the National Council to look at the current structure of General Assemblies.
- 2) Their mandate is to expand on the existing GA Guides to provide details on what is required to plan, organize, and run a General Assembly.
- 3) The GA Working Group will also provide National Council and the RASC Board recommendations for the structure of future General Assemblies.
- 4) The Working Group will look at what would make future General Assemblies more attractive to attendees while keeping in mind that the event must be manageable for the volunteers of the host centre.

Randy Attwood

Chair

RENATA KOZIOL: A SPECIAL THANK YOU



Renata at the unveiling of the RASC 150th Anniversary coin

When I think of the RASC National Office, I think of Renata Koziol. From my initial engagement on National Council, then as Chair of EPO, and then as a Director of the Society, Renata was the one person I could go to for institutional insight into the backroom (often unappreciated) workings of the Society. Through various Executive Directors and Board members, Renata carried so much more than any of us realized. Her personal dedication and accountability to the Society connected her in my mind to the Society more than almost anything else; she was “the RASC National Office.” Having the honour of being appointed President of the Society by my esteemed colleagues is a highlight of my eight years on the Board but the greatest honour I’ve had was in awarding Renata the President’s Award in 2021, recognizing her extraordinary efforts. Renata, we love you and we miss you and we wish you and your family only the best that this world has to offer.

Robyn Foret
President

When I interviewed for my position at RASC, Renata Koziol was the first person I met. I think that for many members of the Society, and for almost a decade, Renata was the first person in RASC that people met. As a Society, we could not have asked for a better first point of contact. Renata was always professional, conscientious, and helpful to anyone who reached out to her, and always responded positively, making each caller or visitor to the office feel that they had her undivided attention. But the real magic of Renata was what she did behind the scenes. For ten years she had a hand in virtually every aspect of organizational operations. She was literally the beating heart of RASC, keeping our many systems and procedures running smoothly. I learned something from her every day and looked forward to her genuine good humour each time I came to the office. It was truly a pleasure to work with Renata.

Phil Groff
Executive Director



RASC Board and Terry Dickinson At GA 2015 in Halifax.
Photo by Chris Gainor

We all know that Renata’s hard work and attention to detail were vital ingredients for the RASC’s growth and success during her time at National Office. These photos show that Renata was also a great ambassador for the RASC in National Office, and at General Assemblies and other events where she helped many members, including executive members, find their way. I always enjoyed working with Renata and I value her friendship.

Chris Gainor, Ph.D.
Past President



Renata, Chris Gainor, Jenna Hinds, and Madison Chilvers at the 2019 GA.
Photo by Chris Gainor

I've served many major charities over the years and worked closely with management and financial executives at each one. Renata Koziol, the Society's Director of Finance for more than a decade, is the undisputed star on every level. Her extensive expertise, knowledge and willingness to give considerable energy and skills to numerous tasks was remarkable.

And what a financial portfolio she managed; accounts receivable and payable for both RASC and SkyNews; the posting and reconciliation of thousands of annual transactions for National and 30 Centres, including donations, subscriptions, membership fees, publications, and merchandise sales. She implemented a major change in the presentation of the organization's financial statements, had all the answers for the annual audit, underwent more than one database conversion, basically delivered the 2019 GA with Randy and several staff members, and handled inventory, insurance, building rental, equipment leases, and payroll duties.

I'm sure I've overlooked some items as I don't think there was an area in which Renata did not have a key role or provided senior input in the five years, we were colleagues. During her tenure, revenues of \$450K per annum more than quadrupled, built on the solid financial foundation she built and delivered.

Although not one to blow her own horn, Renata was greatly appreciated by Centre officials, members, and all who sought financial know-how or assistance of the RASC. Even now, I receive calls from individuals lauding her politeness, institutional knowledge, and ability to get things done. She oversaw junior staff and graciously provided professional support for their career development. She's respected and admired by all who knew her, including myself. I'll be forever grateful for the opportunity to have worked with Renata, honoured by her friendship, and wish her all the best on the next exciting leg of her journey. Ciao Renata!

Lisa Di Veto
Financial Development Officer

Besides being a membership organization, a charity, and a publisher, the RASC is very much a community, be it at the local, regional, or national level. Communities are diverse collections of people—many you develop a life-long bond with, and some you disagree with on seemingly everything. Others are the glue that keep the community together, maintaining connections with seemingly everyone and being a source of community knowledge as people come and go through space and time, and the myriad projects and events that make a community a shared experience.

Renata falls into that latter category and has been very much one of those special people in the RASC. From my time on the National Council through my term on the Board including its presidency, and always as a RASC member, Renata was a steady and effective presence, ready to answer my naïve financial questions with patience and knowledge. I can't recall her losing her patience with me, despite my giving her many reasons to do so! I appreciated her exceptional attention to detail and willingness to tackle many issues beyond her financial role while we were understaffed at head office, all while battling an aging and temperamental membership financial system that would have daunted many people. It was a privilege and a pleasure working with Renata and getting to know her during my time serving the RASC. Thank you, Renata.

Craig Levine
Past President



Renata and CSA astronaut Jeremy Hansen at the GA 2016 in London.
Photo by Randy Attwood

Of all the many, many times I called the Society Office, both as National Secretary and as President, Renata Koziol always greeted me with warmth; we shared a professional respect. I said many times that Renata was the "glue" that held the RASC together. She went about her business with a solid understanding of what was required, and she provided the foundation framework to make it happen.

My positive thoughts are that Renata is still "out there" and we can bask in her radiation from time to time. On the other hand, I will miss her cheery smile and great hugs!

James Edgar FRASC, UE
Past President



RASC staff Julia Neeser, Randy Attwood, and Renata Koziol at Peggy's Cove GA 2015
Photo courtesy Randy Attwood

Renata Koziol worked for the Society for over 10 years in the position of Financial and Office Manager. When Renata started her position at the RASC, she literally had to start from scratch. She learned the ins and outs of our membership and financial systems, and she developed the procedures we use today.

Renata was a pleasure to work with. She was a strong force that kept the RASC machine running smoothly. Working for not-for-profit organization can get very discouraging. On those frustrating days, she always looked on the bright side. The attitude she brought to work every day was positive and kept us moving in the right direction.

She enjoyed working for the Society. She believed in what we do. She especially enjoyed talking to the members.

She was extremely optimistic with the future of the Society. She was excited when we expanded the office space, purchased *SkyNews*, and hired a professional fundraiser.

From the members of the RASC, we thank you, Renata, and wish you all the best in your retirement.

Randy Attwood FRASC
Executive Director (2014–2019)



Julia Neeser and Renata at the GA 2017 in Ottawa. Photo courtesy Chris Gainor



GA2019. Lisa Di Veto, Renata Koziol, and Madison Chilvers

I was probably one of the first “RASC people” to have met Renata, that is, if one excludes the hiring committee (note, I didn’t write “one of the first normal RASC people”!). She seemed intelligent, and quiet. She started her employment a little before the annual fall meeting of Council (this was in the days when the RASC was governed along the model of a parliamentary representative democracy), and it was thought that she should attend the meeting, perhaps to give her some idea of how the RASC worked at that level. (I am unaware of any epiphanies ever dawning from such attendance.) She came out of the experience unscathed, and did manage to laugh at the right jokes. In fact, it soon became apparent that getting her to laugh was its own reward. Fortunately, being the RASC, opportunities were never wanting.

That’s not all, which soon became apparent. She got stuff done; and better than that, she had it done the day before you asked her for it, and often two days before you’d even have thought to ask her for it. Her advice on things financial was invariably good, and she had the ability to dispel the obscurity about abstruse matters of money. She gave excellent advice when there were numerous options and could foresee the potential problems in certain choices. And it was worth asking her opinion on things that were not about finance. She possessed a good eye for design.

The Society was the beneficiary of her decision to work for it. I regret her leaving, but I hope she doesn’t regret having been part of the RASC.

Randall Rosenfeld FRASC
RASC Archivist and Director, Dornier Telescope Museum

Dear Renata;

Whenever I think of the RASC National Office, I think of you. I think of your dedication, thoroughness, attention to detail, extraordinary competency, and your unassailable integrity. I think about how you brought order to chaos, surplus from loss, and worked steadfastly and successfully to improve every aspect of RASC operations. The contributions you have made over your years with the Society are innumerable and invaluable. You embodied the Society's institutional memory. You have been the keystone to the RASC's arch. We never could pay you enough for all the things you did for us! The RASC has been very lucky to have you "on our side."

If I could be there to give you a bouquet of roses, I would. These virtual roses will have to do. They come from the heart.



I remember with great fondness the welcoming atmosphere in the office whenever I came to Toronto. I remember wonderful lunches at Mama's little Italian eatery, just up the street. I recall your subtle humour and ever-present warmth as a person. There are many things about being a member of the RASC's national executive committee that I do not miss. But you I most definitely missed when my roles at the national level were completed. People come and people go, but I knew the RASC was in good hands with you in the office!

Change happens. Things are very different now with an entirely new staffing model, and governance structure. I am far removed from it all and that is a good thing. I hope, along with all the challenges of the last decade, that you will carry with you some happy memories from your time with the RASC. Some of us, myself included, will always remember you with great appreciation, respect, affection, and friendship.

I send to you my best wishes for happiness, success, and fulfillment in whatever you do next in your life and career. I wish you good health and a long and rewarding life.

Sincerely,

Mary Lou Whitehorne FRASC

Past President, RASC

Past President, Halifax Centre RASC

Honourary President, Halifax Centre RASC

Dear Renata

I want to wish you all the best going forward and good luck with the next stage of your life.

You were always very helpful and friendly on the telephone and from where I stand, you were a great asset to RASC National and the general membership.

Your legacy as someone who helped RASC progress and grow over the past several years will live on in our memories and you will be sorely missed.

Thanks for giving 110% to our society and going above and beyond the call of duty.

Sincerely,

Ed Mizzi

Hamilton Centre

A reply from Renata

Over the last 10 years, I've had the opportunity to grow with the company and work with many remarkable people along the way. During my time at RASC I worked with 6 Society Presidents, Board Members, 3 Executive Directors, many Staff Members, 30 RASC Centres, different Committees and most importantly RASC MEMBERS and VOLUNTEERS. I respected the people I worked with and loved the projects I worked on. It's truly been an enlightening journey and I'm grateful to be recognized for my contributions to The Royal Astronomical Society of Canada.

P.S. Mary Lou, thank you for the bouquet of roses....I always enjoyed working with you Chris....Ciao Lisa....No regrets Randall... Craig, thank you for speaking so favourably of my work ethic.

Cordially,

Renata Koziol



Renata Koziol

ANNUAL REPORTS FROM THE CENTRES

CALGARY CENTRE

The Calgary Centre has seen unprecedented growth over the last year, with the membership surpassing 500 for the very first time. With the goal of “shooting for the stars” we have set an aspirational target of reaching 1,000 members by 2027. Although 2021 offered many challenges due to the pandemic, our volunteers and members pivoted and stepped up to provide inspiring service to the region.

The Centre has monthly council meetings utilizing the online format and will continue to do so as it offers an inclusive way for everyone to join conveniently. Throughout 2021, our monthly general meetings took place online and were open to anyone around the globe. We consistently bring in more than 100 attendees, with some lectures peaking at over 500. Based on demographic surveys, we have had attendees from all six populated continents and several people located throughout Oceania.

A significant success in 2021 was the continuation of the 21st-century renovations of the Wilson Coulee Observatory. This major project began in 2019 with brand new roofing and continued forward with exterior renovations in 2021. The building has been upgraded with new siding, windows, and doors to protect the interior from the elements of Southern Alberta, and we have installed high-speed internet for use at the facility. In 2022 we will proceed with the interior renovations, including a new state-of-the-art AV system, scientific instruments, flooring, layout improvements, and a fresh coat of paint.

Our Telescope for Rent program reopened in 2021 to great success. Through our volunteers' hard work and dedication led by **George Grant**, this program consistently loans out 75-100% of its equipment each month.

Our observing programs have been running throughout 2021 in online and hybrid sessions. Instruction has been provided online, followed by a safe in-person observing session later that same week.

The Centre's environmental easement has a new landowner, and we have formed a strong partnership with this family. Through the valiant efforts of our volunteers, we were able to preserve the main stretch of land by diverting the water levels produced by busy beavers. The water table has stabilized, and the land is usable by our members. The Centre actively planned an urban observatory at the southeast city park, Ralph Klein Park. Navigating the bureaucracy and land feasibility challenges, we are on track for a groundbreaking in 2022.

Most of our public outreach in 2021 moved to an online format, with some small activities taking place safely outdoors. The Calgary Public Library youth programming was wildly successful and reached more than 2,500 kids. This program is ongoing in 2022 and has branched out into in-person events at local libraries. We have also re-established a great relationship with the Telus Spark Science Centre. We deliver ongoing programming through their many forms of science communication.

In 2021, we had our first employee funded through the Canada Summer Jobs program. The scope of his work was to upgrade some of our website pages to add aesthetic and functional value. We received the funding again in 2022, which will have him fully

complete the work.

The Centre established a Science Committee dedicated to serving the RASC mandate of making scientific contributions to the advancement of astronomy. Our PARSEC (Promoting Amateur Research and Scientific Exploration of the Cosmos) program is well attended, and several of our members have published scientific material throughout 2021.

The Imaging Committee, conceptualized in 2020 and realized in late 2021 and early 2022, will become a valuable resource for members of our Centre and the public at large. It will offer equipment for our members to rent to capture the night sky on their own. The committee will provide one-on-one mentorship and group lessons in gear and processing.

The Centre has kicked off a much-needed Social Committee. This committee has taken on the herculean task of providing our members with events and resources to get to know each other in more informal settings. They have also taken on the responsibility to welcome new members to the Centre with letters sent to new registrants within 24 hours of joining.

Our social media statistics have seen unprecedented growth. Our Facebook, Twitter, and Meetup followers numbers increased between 15-40% during 2021. We have also started a long-awaited Instagram channel that has been successful in its initial release.

In 2021, the Centre established a new major award known as the F. John Howell Science Award. The Centre grants this award to an amateur astronomer who has made a significant contribution to science during that year.

COMMITTEE WORK

Finance

The Calgary Centre has greatly benefitted from the tireless volunteer effort of a professional accountant, **Russell Dueck**. Through his work, the finances have never been in better shape for us to invest in our greatest asset, the membership.

Observing

The local NOVA (New Observers to Visual Astronomy), OG (Observer's Group), and YG (Youth Group) have all seen great success throughout 2021. With the dedication of Observing Chairperson, **Jack Milliken** and Youth Leader, **Doug Thorp**, these programs thrived during the pandemic. Also, since October, we have moved to a hybridized version of the programs to engage people online and in person at the Wilson Coulee Observatory. This gives members the chance to join the classes, while maximizing their time under the sky later in the week to fine-tune the skills they learned earlier. The interior renovations at the observatory in 2022 will increase the facility's capacity and flexibility in usage.

Property

Wilson Coulee Observatory (WCO) Subcommittee

In 2019 we started a job that will likely continue for several years. Council member **Philip Tracey**, a former roofer, led a volunteer team of **Brian Lyonnais**, **Roland Dechesne**, and **Simon Poole** to strip the roof and replace it with new shingles. Repairs to the underlying roof were made along the way.

In 2021, council member and WCO subcommittee chairperson **Eric Klaszus** successfully led an effort to replace the exterior of the building. This involved obtaining new doors, windows, and siding to protect the interior from the inclement weather. Many

volunteers from the Centre joined in to strip off the old siding, while Eric installed the doors and windows and prepared the underlining structure for a contractor to complete the siding project. This took many dedicated volunteer hours, and we are grateful for the support of those who participated.

Eric's countless hours leading this project was one of the many reasons that led to him receiving the 2021 President's Award.

With Eric's continued strong leadership, the WCO will undergo additional vital renovations in 2022. This will include removing the existing washroom infrastructure, walls, and flooring. The entire floor will be replaced by industrial laminate. The washroom will be redesigned to make it safer, accessible, aesthetically pleasing, and useable for members and guests. With the critical input of our Librarian, **Judy Sterner**, the library will be redesigned to make it easier for our members to read, study, and check out books to aid them in research and observing goals. A new AV system has been installed with modernized visual and audio upgrades. A fresh coat of paint, essential repairs, and beautiful professional artwork obtained and donated by **Simon Poole** will enhance the interior of the building to make it friendlier and a key destination for astronomers in the Calgary Region.

Eccles Ranch Observatory (ERO) Subcommittee

The ERO serves as a dark-sky camping area for regional members to freely attend. It is located under the pristine skies of West Central Alberta on an environmental easement given to the Centre several decades ago.

Beavers on the site relocated adjacent to the camping area of the facility and, through their efforts, raised the water table to be near even to the land. This caused swampy conditions not conducive to vehicles or patrons using the site. ERO Site Director, **Frank Hendsbee**, led a dedicated team of volunteers consisting of his brothers-in-law and council member **Phil Tracey** to mitigate the damage. Through an ingenious water diversion plan and structural design, they lowered the water level by more than a metre, while preserving the beavers inhabiting the easement. The land reverted to its drier state and is, once again, safely usable for our members.

A new family purchased the land, and we have been forming a strong partnership with them through ongoing mutual respect and discussions on how to best work together. The continued engagement with the new owner is vital to learn how to enhance the site for dark-sky preservation and to make it better for our members to use throughout the summer. 2022 will see a clean-up of the site and continued regular maintenance to ensure the water level remains constant.

Ralph Klein Park (RKP) Subcommittee

The RKP project saw its share of successes and setbacks throughout 2021. **Robyn Foret** has been the leading force behind this project. The land has been tested, and a local, experienced observatory designer was selected to complete the urban observatory project. The RKP site on the city's southeastern edge has an excellent, accessible indoor classroom facility that can hold several hundred people. Before the pandemic, we held public star nights that drew more than 750 people to learn more about the night sky. This infrastructure will be critical to engaging public members in astronomy. Local member **Bill Peters** donated his large refractor telescope that used to be housed at the old city Science Centre to the project. This telescope will be integrated into the urban observatory to be enjoyed again by residents.

Library

Our Librarian, **Judy Sterner**, has done an excellent job maintaining and improving our Centre's library over the last several

years. Archived materials have been rediscovered and will be digitized to dovetail into our Centre's local history. Judy has been instrumental in drafting the policy records for the library to be included in our policy manual. New books have been donated, recorded, and filed into our library, while other, older, or duplicate books have been discarded through giveaways to interested members.

With the outstanding efforts of council member **Adriana Stone**, new shelving has been donated by **Stantec** that will be used during the interior renovations of the WCO to store our library collection.

Public Education

The Public Education Committee has been especially busy throughout the pandemic ravaged 2021 year. Even though the in-person events were significantly cut back, we have seen an unprecedented level of online events. Our great partnership with the Calgary Public Library (CPL) has resulted in many follow-up opportunities. The CPL youth program started in 2019 as a summer program at every library branch in the city and moved online in 2020 and 2021. Most Saturday mornings, several volunteers from the Centre tuned in online to present an astronomical topic to youth. This program has a huge following and became the most successful program CPL hosted during the pandemic. We reached more than 100 youth in some sessions and averaged more than 70. Over the year, we reached at least 2500 young people.

The Centre also had the fortune of re-establishing good relations with the Telus Spark Science Centre. Since 2019 Centre members have provided programming support to Telus Spark with various activities. These activities included youth summer camps, keynote lectures, adult-night space programming, public star nights with telescopes, and presentations to classrooms with the Calgary Board of Education. 2022 will see additional growth of this partnership as they hope to refocus on astronomical topics and activities. We will be a crucial player in that growth.

The Centre also continued to show support to our local communities and partners. We have been instrumental in providing continued support and investment in the University of Calgary's Rothney Astrophysical Observatory. We continue a strong relationship with Alberta Provincial Parks, City of Calgary Parks, and communities throughout the region. New partnerships are in their early stages as we look to enhance our reputation with nearby cities, towns, libraries, and community groups.

Marketing

The Centre has successfully brought many non-members to our general meetings through social media and the personal touch of our many volunteers. More than 50% of our attendees are not yet a member of our Centre. There is still room to improve, especially as we go back to in-person events hybridized with an online option. Social media followers increased by 20%, and we hope to continue that trend throughout 2022.

Opportunities for improvement include reaching out to interest groups throughout the region who can then, in turn, market our events to their members. Media engagement was not as high as in previous years, and we are looking to improve it for 2022.

A new initiative that was put forth was to enhance our visibility in community newsletters throughout the region. These newsletters reach tens of thousands of Calgary and Region residents and offer an accessible location to market our great Centre. **Patricia Jeffery** started this late in 2021, and it has continued to grow throughout 2022. Her articles are being published in more community newsletters each month and reaching a larger audience.

Membership

At the start of 2021, we were at 440 members, and by the end, we

were at 475 members. When writing this report in 2022, we are at 540 members. This unprecedented growth during the headwinds of a pandemic can be attributed to many factors. Our incredible volunteers are the most crucial factor, whose ambition and dedication are inspiring. We have also been investing significantly in new membership benefits and enhancing communication channels so that all members have a place to turn for support. The two pillars of membership growth, recruitment and retention, are an ongoing area of focus. The Centre's Social Committee has played a vital role in membership retention by creating new activities to develop relationships among our group of astronomers.

A membership exit survey has been generated by council member **Andrew Bennett**. It was instrumental in catching some members who may have considered leaving the RASC family. This survey provided critical feedback that allowed the council to adjust and offer better services and investments to our membership.

Social

The new Social Committee is an energetic team put together by **Heather Laird** in 2021. The committee has worked tirelessly to develop and bring events to our membership to engage them in a fun, friendly, and inclusive environment. The committee also took on the difficult task of monitoring member retention, and developing a plan to enhance the renewal rate. A new welcome letter was drafted that outlines all the benefits of being a member of the Calgary Centre. Each new member receives this letter in a personalized email. This letter has received overwhelmingly positive feedback and has been a vehicle to drive new members out to activities. The Social Committee has been vital in producing new material for the Centre to use as door prizes at events. A set of Calgary Centre stickers was recently created and has become a hit with the membership and public. This dovetails very nicely into the Marketing and Membership Committee goals.

As more people become comfortable with in-person events, the Social Committee will become a critical element to the success of the Centre.

Science

The Science Committee was formed in early 2021 to push forward the mission and mandate of the RASC. 2nd Vice-President **David Brown** founded the PARSEC program as a vehicle to engage members interested in producing and learning about the science of astronomy. The PARSEC program meets regularly each month with a keynote speaker and discussion on the scientifically based work members have been doing.

Fellow member, **Laurie Sibbald**, managed to produce a light curve of a transiting exoplanet from the light-polluted suburbs of Calgary. His work was published, and he has given talks on the subject at the national level. This work resulted in him receiving the inaugural E. John Howell Science Award. The Calgary Centre grants this award to an amateur astronomer who has made a significant contribution to science during that year.

The Science Committee has also been active in acquiring new gear for our members to pursue science. The WCO now has a pair of active meteor cameras that act as a regional base to triangulate meteors for databases. The WCO now houses a Planewave Telescope that will be used for occultations and other scientific endeavours.

Imaging

The creation of an imaging committee has been a goal of the Centre since 2020 and has recently gained traction with more than a dozen members. The committee, led by former Centre executive, **George Cavanaugh**, will be an incredible boon to the member-

ship of the Centre. It will offer equipment for members to borrow and mentorship on using it. This mentorship includes help with processing images to obtain a final product. This will be accomplished by setting one-on-one appointments with experienced members and group classes. This will be an excellent retention benefit and one that can draw in a significant number of local photographers to join the Centre to participate. We anticipate this program will begin in September of 2022.

Fundraising

The Centre was engaged in several fundraising opportunities throughout 2021. The Spring Fundraiser brought in a significant amount of funds by auctioning essential astronomical items and photographic artwork. We also received funding from the Government of Canada through their Summer Jobs Program, which allowed us to hire a student employee during the Summer. We are also grateful for the many donations of money and in-kind offerings from our generous members.

Program

The Program Committee was very busy during 2021 as they brought in many great guests to give lectures at our General Meetings. In some cases, our meetings reached more than 500 people around the globe with world-class presentations. We showcased notable scientists and astronomy students from various backgrounds and had our most inclusive speaker lineup ever. This has continued throughout 2022 as we move to a hybridized format of in-person and online presentations.

Our partnership with the Calgary Public Library was instrumental in bringing these programs to the membership and public. They have kindly hosted these meetings and provided staff support throughout the year. This has provided us with a free platform and in-person theatre to continue to host world-class speakers.

Technology

By utilizing the Canada Summer Jobs program, we hired the Centre's first employee, dedicated to updating many pages on our website. Our Webmaster, **Larry McNish**, has been an instrumental and critical volunteer who curated our website. The content generated by Larry could fill astronomy textbooks with important information. We wanted to enhance our online portal to showcase what we are doing as a Centre through Larry's insight, while maintaining great content. This work will continue in 2022 as we complete the ongoing project with new key features, such as online booking options for the ERO and easy donation options to aid our Fundraising Committee.

Conclusion

The Calgary Centre has seen great success throughout the pandemic-affected year of 2021. We increased the size of the organization, enhanced the membership experience, and continued to be fiscally responsible. This success would not have been possible without the enormous dedication of volunteers who significantly contributed to an ambitious plan of revitalization and growth, with a keen eye on inclusivity.

Peter Brackett
Secretary

2021, another year done but COVID isn't going anywhere; or is it? Isn't it? That's exactly how the year went, a few restrictions were lifted, and then they weren't, then they were lifted again, then they weren't yo-yoing back and forth. The RASC Edmonton Centre decided to remain online. We tried to avoid as many in-person outreach events as possible and continued with the online events we created for another year and for the indefinite future. A reminder of what we were forced to create in 2020 follows.

"News from Space" prepared by our very own Mr. Geoff Robertson continued to play in our regular monthly meetings. Last year, Geoff also started another video series on our Edmonton YouTube Channel (www.youtube.com/user/edmontonrasc) called "What's Up Over Edmonton." We started this series to cater to the skies in our latitude. Another video that we post monthly is the Astro Café hosted by fellow member Alister Ling. We recommend you check out these videos along with the others we have posted and tell us how we did by commenting on them.

As mentioned earlier, we tried to avoid as many in-person outreach events as possible. However, we were asked to join the Jasper Dark Sky Festival (JDSF) in October. After determining the COVID protocol that the JDSF had in place was okay, we finally agreed. Many volunteers made their way throughout the day to Jasper to set up on Friday, October 22, for our night-sky viewing event, and stayed the weekend to do some outreach solar viewing on Saturday and Sunday, 23rd and 24th. There were no shuttles provided, so we stayed in town at Commemoration Park on Friday, and at the Jasper Information Center lawn for the daytime events.

The organizers of the festival requested a smaller contingent of eight astronomers, all of whom had partners who also contributed knowledge and support for the three events. Masks were worn, wipes and sanitizing solution were supplied, and festival volunteers asked for proof of vaccination from the attendees. Social distancing was encouraged.

Unfortunately, the weather did not cooperate for the most part, although the promised rain held off until after Friday evening's event. Heavy clouds precluded viewing, even obscuring the teahouse light on the mountain. However, the people that came out were excited to look at and talk about the telescopes and binoculars on a tripod that we had set up on a covered stage. Sets of our Centre's space object trading cards had been prepared and were given out along with planispheres and lunar information cards. Members Rick and Susan Bramm offered 3-D pictures of Mars landscapes, as well as a book of astrophotos, solar photos, and information to go with them. We had several devices to further show our astroimagers' work. Good astronomical conversations were had about a wide variety of topics with the estimated 50 plus visitors, and the evening felt like a success despite the absence of stars.

Saturday brought more clouds with the sun appearing for just a few minutes to view through the variety of solar scopes. However, the same backups as on Friday night filled the gap, and around 100 to 150 people seemed happy to be there.

The rest of the day was free, and most of us attended a lively debate about the future of space exploration and the possibility of colonization of the Moon and Mars, enjoyed a JDSF volunteer appreciation dinner with great food and company, and watched a drone show that featured coloured lights making patterns in the (cloudy) night sky, illustrating a story with music that was performed on the stage at Commemoration Park.

Better late than never, the blue sky finally appeared on Sunday, and the solar scopes and telescopes with white light filters got a good workout. Four monitors with boxes to shade them provided live feeds from their solar scopes, which allowed viewing without touching to minimize viral transmission risk. A spectrometer provided from the University of Alberta was demonstrated, as well as more card sets, etc., given out to the 250 or so people that came out.

Many thanks to the participants of the Edmonton Centre and JDSF volunteers, as well as our organizing committee for organizing yet another successful event. The Edmonton volunteers are listed below:

- Abdur Anwar & Nikkia Janssen
- Arnold & Sonia Rivera
- Berta Beltran & Carsten Krauss
- Chris & Monica Meerveld (also on organizing committee)
- Jay Lavender & Daisy Alferez
- Jon Stolte & Sukrit Ahluwalia Rick & Susan Bramm
- Alan & Marion Hobbs (also on organizing committee)

Our second event was not really an outreach event due to the fact that restrictions were yet again back in effect. We kept the audience to members only and officially met for the weekend around the new Moon on September 10 to 13. Members who were able and comfortable to meet, gathered at the usual Black Nugget Lake Campground southeast of Tofield, Alberta. Some arrived a few days earlier to get the most of their experience and stayed for a total of five days; more came for only the weekend. We had a total of 45 members in attendance, despite the prevalence of diminishing clear skies. However, our attendees took maximum advantage of the clear skies when they occurred.

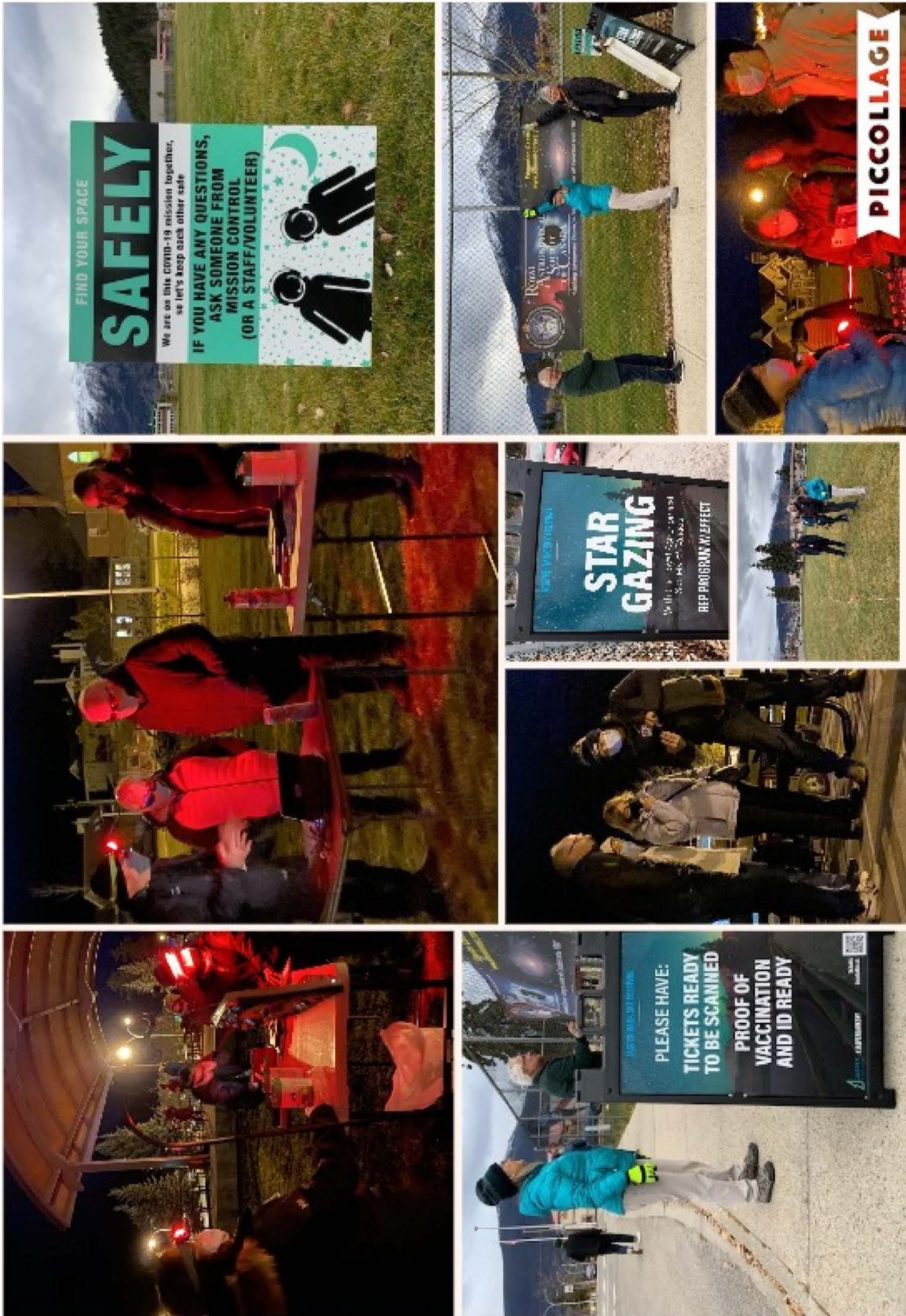
On Saturday afternoon, we had three short presentations outside, with the audience sitting in a wide, socially distanced circle. Fellow long-time member of Edmonton Centre Dr. Doug Hube discussed the evolution of the 1967 nova in Delphinus "Nova Del 1967," using printed examples of spectrograms obtained at the David Dunlap Observatory using the 74-inch telescope. Kathleen Houston, an RASC member from Saskatchewan, read the latest version of her poem "Cosmic Dreams." This work in progress is a literary tribute to the wonders of visual observing and space-exploration achievements, with charming references to many events we have followed over the past 40 or so years. Rick Bramm talked about the photos of Jezero Crater's windswept floor taken by NASA's Mars Perseverance Rover, before treating attendees to 3-D images he has created from the posted photos.

Despite the mostly cloudy skies, two attendees succeeded in completing observing certificates at Levels 1 and 3.

This special event succeeded in bringing people together and creating momentum and hope for next year's return to a more full-featured 2022 Northern Prairie Star Party that will run from 2022 September 20 to 25.

Being online provided our Centre a great opportunity to grow digitally and we hope we can incorporate it back into our new normal, if that day ever comes. Until then, happy Zooming and we will give you more updates next year.

Sukrit Ahluwalia
Secretary









Despite the effects of the pandemic, Halifax Centre had a busy and successful year with regular meetings and a variety of outreach events promoting astronomy to its members and the public, when allowed. The Outreach Committee and many Centre volunteers carried out activities and worked in partnership with Saint Mary's University (SMU), Dalhousie University, the Minas Astronomy Group, and The Discovery Centre to host and support many programs and activities.

In the latter part of the year, a member survey was conducted to assist the Board in planning activities and priorities for the coming year. Several suggestions will be implemented in the coming year.

Centre Meetings

Ten monthly meetings were held the first Saturday of each month. Ever since the first provincial lockdown on 2020 March 22, Member and Board of Directors meetings were held via Zoom. Members' meetings were recorded and posted on the RASC Halifax YouTube channel. The Annual General Meeting (AGM) was held using Zoom on 2021 December 4. Our Members' BBQ, traditionally held in September, was again cancelled due to provincial COVID restrictions.

The Halifax Centre continued hosting a series of speakers at each monthly meeting with attendance varying from 35 to 50. Regular presentations included Paul Heath's monthly instalment of Food for the Soul, Paul Gray's Member Photo Montage, Dave Chapman's What's Up?, and Judy Black's News from the Board. The What's Up in the Night Sky? session is posted and highlighted separately on our RASC Halifax YouTube channel.

Meeting presentations included

January	Kaja Rotermund (Gravitational Lensing)
February	Glenn Roberts (How I fell into a Black Hole my journey to becoming an astronomy columnist)
March	Dr. Luigi Gallo (Black Holes: The Loud, the Quiet, the Silent) and Michael Gatto (Sketching & Digitizing Mars)
April	Adam Gonzalez (High-velocity Outflows in active galactic nuclei), David Chapman (RASC Double Star Observing Program)
May	Chris Gainor (The Use of the HST by Amateur Astronomers), Tony Schellinck (Basics of Lunar Sketching)
June	Dr. Leslie Sage (Life with NATURE), Chris Young (Sky Lore)
September	David Hoskin (The Almost Great Comet of 2020), Chris Young (Sky Lore, or Meanderings in Cultural Astronomy)
October	David Hoskin (Hydrogen Alpha Solar Imaging), Patrick Kelly (The Instability Gap & Cosmic Distance)
November	Lisa Ann Fanning (The Link between Animal Behaviour and Astronomical Events), David Lane (The Mini Robotic Observatory), Chris Young (Sky Lore—Desert Navigation and Aurora Borealis)
December	Dr. Phil Groff (News from National RASC)

Halifax Centre Website

<https://halifax.rasc.ca/index.php>

The Centre's website is administered by Jerry Black, Judy Black and Dave Lane and is hosted at Saint Mary's University. The website includes updated Halifax Centre information and has site search capabilities.

Halifax Centre Policy Development

<https://halifax.rasc.ca/index.php/about-us/policy-documents>

Thanks to the work of Judy Black (Chair, Governance Review Committee), Paul Gray and Gregg Dill, one policy was revised, and a new policy approved:

- Policy G6: Procedures Regarding Nomination, Elections and Appointments (revisions only)
- Policy G11: Policies Regarding RASC Halifax Centre Membership and Conflict Resolution

St. Croix Observatory (SCO)

The Centre's dark-sky observing site is approximately 40 minutes from Halifax. The Observatory has three buildings: observatory with a roll-off roof and a 16" Go-To Sky-Watcher Dobsonian, warm room, and storage/toilet facility.

An upgrade to the site is underway following a couple of fundraising initiatives that included member donations and an astroimages sale, with photos provided by Blair MacDonald, David Hoskin, Jerry Black, and Jason Dain. Other funding sources are being sought.

Because provincial health restrictions affected attendance at our observatory, a task team was struck to determine how to remain open and to review the policy as restrictions changed in the coming months. Many thanks to Kathy Walker (Team Lead), David Hoskin, and Judy Black for their diligent work.

Halifax Centre Newsletter — Nova Notes

Lisa Ann Fanning (Editor) and John McPhee (Copy Editor) produced 5 editions in 2021, with a range of 20 to 33 pages per issue. All were posted on the Centre's website with notifications emailed to the list. The newsletter contained messages from the Editors and the President, book reviews, astronomy science and imaging articles, astrophotos, poetry, and Member Meeting summaries. Our editors will continue into 2022.

The contributors to *Nova Notes* were Dr. Roy Bishop, Jerry Black, Judy Black, David Chapman, Jason Dain, Tim Doucette, Lisa Ann Fanning, Paul Heath, Melody Hamilton, David Hoskin, John McPhee, Tony McGrath, John Read, and Mary Lou Whitehorne. Photo contributors were Dr. Roy Bishop, Jerry Black, Judy Black, Dave Chapman, Jason Dain, Tim Doucette, Lisa Ann Fanning, Paul Heath, David Hoskin, Chris Kelly, Blair MacDonald, John McPhee, Fiona Morris, John Read, Kathy Walker, and Jaime Whynot. Astro-sketchers were Judy Black, Dave Chapman, Melody Hamilton, and Paul Heath.

Education and Public Outreach

We participated in only a few school and park presentations and a few outreach events. Members conducted astronomy presentations in support of the Deanery Project. We celebrated over 2400 Galileo moments in 2021, with approximately 40% being youth! An ImagesPlus masking session (Blair MacDonald) was held virtually and recorded. An InOMN session on the Halifax waterfront was not held this year.

Nova East Star Party, Smileys Provincial Park

Nova East 2021 was cancelled as a camping event due to COVID-19.

Halifax Centre Astroimaging Contest

The astroimaging contest was held with a record 24 submissions. The winners were announced virtually at the December Member Meeting. Thanks to our adjudicators Blair MacDonald, Fiona Morris, and Tim Doucette. Congratulations to our winner Jason Dain for Wide-Field (Milky Way and Moon), for Solar System (ISS Solar Transit), and for Deep-Sky/Prime Focus (Andromeda Galaxy). Chris Kelly won the People's Choice Award for his photo Touching the Cosmos. Thank you to all to submitted and to Alan Sutherland of Atlantic Photo Supply for the generous canvas reprint prizes for the winners.

Dark-Sky Preserve (DSP) Support

The Centre supported Kejimikujik National Park and National Historic Site which has been a Dark-Sky Preserve since July 2010. The Dark-Sky Weekend was held this year, following all the COVID-19 provincial restrictions. David Chapman and Chris Young provided a sky tour and told sky lore at the Sky Circle. Tony Schellinck and Judy Black led the binocular table, assisted by Daphne Themelis and Peter Hurley. David Hoskin, Jeff Donaldson and Jerry Black had telescopes with camera and laptop to showcase deep-sky objects.

Thanks to co-chairs David Chapman and Tony Schellinck for their continuing consultations with the Park.

Member Achievements & Recognition

Congratulations to two members who received RASC Awards:

- Blair MacDonald—RASC Service Award
- James Edgar (Associate Member)—Fellow of the RASC

RASC Explore the Universe certificate was awarded to Elsie Ferguson and Jeanette Kenny. RASC Explore the Moon observing certificate (telescope version) was awarded to Judy Black, Lisa Ann Fanning, Liz Greenough, David Hoskin, and John Read with the binocular version awarded to Liz Greenough and Melody Hamilton. RASC Double Stars observing certificate was awarded to Melody Hamilton.

Special congratulations to Fiona Morris on winning runner up in the youth category of *SkyNews* for her photo of the Andromeda Galaxy, and to Kathy Walker for her image of M13 on a 2-page spread of the latest edition of the Backyard Astronomer. Several others were featured in various publications and podcasts:

- *SkyNews*—Meeting Halfway, Seeing the Whole Picture (David Chapman)
- JRASC (David Chapman, James Edgar, Michael Gatto, Blair MacDonald).
- RASC Weekly masthead (David Hoskin's photo).
- RASC Moon at Noon (John Read)
- 2022 RASC Calendar (Fiona Morris, Michael Gatto)
- AstroBackyard in Backyard of the Week (Jason Dain)
- Actual Astronomy (David Chapman was a guest on Saskatchewan's podcast)
- CTV News (Weather) (David Hoskin photo Moon Rising Over the Ocean, taken at York Redoubt)
- EarthSky (David Hoskin's M81)

Keegan Oickle and Fiona Morris were involved with planning and presenting at the virtual RASC General Assembly. Well done!

Goals for 2022

Despite the challenges being presented by the Omicron variant of COVID-19, our hope is for Halifax Centre to continue to facilitate and to instigate public and member education and outreach programs. It will support Kejimikujik National Park and National Historic Site, maintain the Centre and Astronomy Nova Scotia websites, and revise the Board Reference and Policy Manuals as required. Nova East Star Party date is 2022 August 26–28, but is once

more on hold until restrictions for gatherings and provincial park camping abilities are established. The Centre will also determine the Centre's fiscal, event, and activity priorities for the coming 3–5 years, including its relationship with The Discovery Centre, The Deanery, and the planetarium.

Judy Black

President

KINGSTON

CENTRE

We had 10 Regular meetings, including the Annual Meeting on November 10. Our meetings had guest speakers, or our members presented to us. We had David Levy starting us off with a hello and Hank's Sunspot (Hank Bartlett) and Rick's What's up in the Sky (Rick Wagner), which are monthly presentations.

Minutes were taken for all Regular meetings, which were also recorded on ZOOM and are on the Kingston Centre YouTube channel. Invitations were sent out on Face Book, Twitter, and the Rascals email list, and on our website.

We also had three Executive Meetings to discuss Centre business, but the Executive also has many discussions via the email board list.

December 9 The RASC Robotic Telescope with Jenna Hinds

January 13 Members' Presentations

February 10 Judy Black President Halifax Centre—"How Observant! An Introduction to Observing"

March 10 Dave Lane—Observatory Director of St. Mary's University speaking on the Robotic Telescopes, Ralph (Burke-Gaffney Observatory), Little Ralph, and his own ARO (Abbey Ridge Observatory).

Also in March the FLASH Science Fair 2021 (March 28–April 1) went ahead virtually this year, and the Leo Enright Science Fair award for 2021 was awarded to Reed of Kingston Christian School. Reed's project was on Rocket ships. Thank you to Bruce Elliott, Elena Zanetti, and Graeme Hay to help judge this event and deliver the prize. Our Event poster was published on the FLASH website, Facebook, Twitter, and the Queen's University Astronomy Website.

A Virtual Astronomy Session with Leahurst College on March 30 was arranged and presented by Bruce Elliott, Graeme Hay, Francesco Ambrogi, and Kevin Wenkoff. This consisted of four segments with a presentation from each How old is the universe; How big is the universe; What is the Universe made of?; and Facts about the universe! This helped the students along with their Science Curriculum on Astronomy. Topics included It was very well received and very much appreciated.

April 14 VP Laurie Graham spoke on "A Tale of Two Torqued Terrestrial Bodies"

May 12 Mark Coady Light Pollution Victories in Peterborough

June 9 Dr. Doug Johnstone—Up All Night—Life at the Summit of Maunakea from NRC Herzberg U of Victoria, and Robert Bates Astrophotography-Globular Clusters from RASC Belleville Centre

- July-August no monthly meetings were held
- September 8 Guest Speaker Murray Paulson from RASC Edmonton Centre who spoke on Finding Meteorites.
- Fall N Star's September 10–12—hosted by the RASC Belleville Centre was held in Prince Edward County, Johnson RV Park. Full Covid protocol was in effect.
- October 13 Members' Meeting with a new twist—A Quiz. Put those thinking caps on.
- November 10 Our Annual meeting and Regular meeting to follow with main speaker Rick Wagner.
- December 8 still to come. But this will be a virtual meeting as well.

The Secretary for 2020–2021 Asser El Gindy resigned this position in September. At that time the President took over the minutes and prepared this document for submission and approval by the Centre to be forwarded to the National Society. This position is open for Election at the Annual Meeting.

Kim Hay
President

KITCHENER-WATERLOO CENTRE

Our Kitchener-Waterloo Centre started its 69th year as an astronomy club. Founded in 1953 as the Kitchener-Waterloo Amateur Astronomers and Telescope Makers, we became a RASC Centre in 1984. 2021 was our second year living with the COVID-19 pandemic. We had two meetings a month, all of them held online using Zoom. Outside activities were limited. Our membership numbers have remained stable at 148.

Notable Speakers

- Dr. Lauchie Scott—“Space Situational Awareness,”
- Dr. Norman Hey—“Bringing the Solar System to Your Neighbourhood,”
- Alen Ward—“Super Planetary Telescopes,”
- Dr. Ralf Gellert talked about his work with rovers on Mars.
- Peter Jedicke from the London Centre presented “Why I Love Globular Clusters.”

Mentionable Members

At the heart of our club are the people who bring their years of experience and passion to make our Centre the success it is. Here are some of our most notable members in 2021.

Ron Brecher continues to astound us with his astrophotography. He was featured on the cover of Amateur Astronomy Magazine Winter 2021 issue. His article “Catching Celestial Butterflies” was published in Sky & Telescope, February issue.

Ellen Papenburg continued as our “Comet Lady” with regular comet news. She got us out in December to observe Comet Leonard.

Marie Newnham continued to impress us with her knowledge of the Moon and her use of the Slooh Telescope in the Canary Islands to observe deep sky objects.

Michael Wright became our most prolific speaker on deep-sky objects. He also took over as the presenter for “What’s Up.”

Steve Holmes chaired the Stargazers 101 meetings and helped run the RASC Sierra Remote Observatory (SRO) program. He is also the lead on the Lisa Lynn Bissett Memorial Observatory (LLBMO.)

Gerry Bissett has continued work on LLBMO. It had its first light in Listowel and will be a remote observatory for subscribers. Gerry, a long-time member, has donated the equipment and telescope to the club as his legacy project.

Rudolph Dorner continued work on his legacy project: the Dorner Telescope Museum. It is collocated with the RASC National Office in Toronto. Though the opening has been delayed by the pandemic, acquisitions continue. Randall Rosenfeld, RASC Archivist, is the museum curator.

Jim Goetz was awarded the Centre’s 2021 Ray Koenig Award for his years of work.

Activities Or “What The Club Got Up To In 2021”

A telescope can take a long time to build. Even more so when you make six. Rhett MacKend, Peter Pekurar, Alan Ward, Karol Socander, and Brian Hollander are building five 20-inch light-weight telescopes. Each person is contributing their own expertise to the project. Jim Fairles is building his own 10-inch called the “Perfect Ten.”

On November 29, the International Astronomical Union announced that Asteroid 10077 1989 UL1 was renamed to honour Ray Koenig. Asteroid (10077) Raykoenig + 1989 UL1 is located in the Main Asteroid Belt between Mars and Jupiter. Ray Koenig began the Physics Department at Wilfred Laurier University in Waterloo, Ontario. He dedicated his life to teaching Physics and Astronomy. Ray was many times President of both the Kitchener-Waterloo Centre and its predecessor, the Grand Valley Astronomers. Construction of the Centre’s observatory near Ayr (1974–2010,) also occurred under his leadership. Ray was an avid astrophotographer. As far back as the early 1970s, long before personal computers, CCDs, or digital cameras, Ray was taking outstanding celestial photographs on colour film. The Centre’s annual award to recognize members, for outstanding service, is named to honour Ray.

Our Annual Astrophotography Contest was its usual big hit. There was a five way tie for best overall.

Star Parties and Outreach.

Well, it wasn’t a great year for star parties, but we managed to sneak in a few. Sidewalk astronomy was performed at McLennan Park and on a local golf course. Our Perseid Meteor Star Party was pretty awful. Setting up next to a lit baseball field to look for faint objects was not my brightest idea. In September, our Equinox Star Party was held at Bayfield. It was a couple of nights of dark-sky awesomeness and social interaction. Maybe it was the largest star party in Canada this year. We helped the Kitchener Public Library kick off their astronomy program.

Conclusion

Thanks to our members for their dedication and hard work that has kept the club alive in trying times. Once released back to normalcy we will hit the ground running.

Jim Goetz
Communications Rep

Introduction

The RASC London Centre is pleased to report that while 2021 was another challenging year due to COVID-19, the Centre maintained our regular monthly Member Meeting schedule, and participated in outreach events using the Zoom video platform. Our membership increased from 78 members to 87 for a growth of 11.5%.

Monthly Member Meetings

The Centre held its Member Meetings on the third Friday of each month. The meetings were opened by President Rick Saunders, followed by a PowerPoint Presentation on observing by Dale Armstrong, the Observer's Chair, then followed with either a member or Guest of Honour (GoH) presentation. Attendance at our monthly member meetings ranged between 20 and 35 attendees.

The main or Guest of Honour speaker and talks were:

- | | |
|--------------|--|
| January 15 | Member's Night, Mike Hanes, a former London Centre member, presented on "Building a Backyard Observatory." |
| February 19 | Bjarni Tryggvason, Canadian Space Agency astronaut, Dave Rubenhagen, and Rick Saunders, each London Centre amateur astronomers, presented an interactive talk on "A Thermal Transfer Experiment Flown on the ISS." |
| March 19 | Dr. Pauline Barmby, Professor, Physics & Astronomy Dept. UWO—"The 2020 Long-Range Plan for Canadian Astronomy." |
| April 16 | Dr. Ann Hornschemeier, Chief Scientist NASA Goddard Space Centre, presented on "Surveys of the Variable X-ray Sky eROSITA, Athena WFI and STAR-X" |
| May 21 | Dr. Sarah Gallagher, Professor, Physics & Astronomy Dept. UWO, presented on "Breathing and Blustering, Bellowing Black Holes." |
| June 18 | Dr. Jan Cami, Associate Physics & Astronomy Dept. UWO, presented on "Hiding in Plain Sight (lines) Mysterious Cosmic Molecules." |
| July 16 | Philip Downey, Amateur Astronomer,— "Astronomy Quiz." |
| August 20 | Dr. Mark Tovey, Public Historian, Department of History UWO,— "Seeing the Skies Through a Poet's Eye." |
| September 17 | Member's Night, London Centre members Norm McCall presented on "Deep-sky Images from SkyThrall Urban Observatory," Brian Parsons presented "Astrophotography of the Moon and the Explore the Moon Certificate," and Peter Jedicke presented, "The Inspiration4 Mission." |
| October 15 | Dr. Neven Vulic, Postdoctoral Research Associate at NASA Goddard Space Center presented on "Normal Galaxy x-ray Emission with the eROSITA EFEDS survey. A preponderance of star-forming galaxies?." |
| November 19 | Dr Gregg Wade, Dean, Faculty of Science Research, Royal Military College, presented on "Magnetism of Hot and Cool Supergiant Star." |

December 17 Stuart Heggie, Amateur Astronomer,— "The RASC Remote Telescope Project."

Executive Meetings

The Centre had two formal Executive Meetings to discuss and approve items per the published Agenda. The meetings were held via Zoom on August 16 and October 14.

London Centre Outreach Events

For calendar year 2021 there were a total of twelve Public Outreach Events involving RASC London Centre members with a total of 1,215 participants by members of the Public.

Western University Hume Cronyn Observatory Outreach

Of these events, 10 were Virtual (Zoom) Public Nights and Special Events at Western University's Cronyn Observatory for which there were 1,175 public member visitors. The events were organized by Professor Jan Cami of the Western University's Department of Physics and Astronomy and Institute for Earth & Space Exploration (Western Space) with the support of seven London Centre volunteers. As they were conducted as Zoom webinars, the visitor engagement numbers included visitors participating via the Cronyn Facebook and Western Space Facebook livestreams.

Some of these events were supported by Norm McCall who provided live views of the sky using EAA technology on his C11 EdgeHD telescope from his SkyThrall backyard observatory.

Other Outreach Events

There were also two London Centre Public Outreach events involving the Annular Solar Eclipse on June 10, including one event held at Scenic View Park, in the Byron District of London, with 28 visitors (including five youth counted), and five RASC London members. A second event was held simultaneously on the hill in front of Western University's Brescia University College, with twelve public visitors and supported by one RASC London member.

London Centre Volunteers

The London Centre member volunteers who supported these outreach events included Dale Armstrong, Dave Clark, Heather MacIsaac, Mohammed Mubeen, Bob Duff, Peter Jedicke, Henry Leparskas, Mark Tovey, and Norm McCall, for a total of 126-person volunteer hours over the events and a total 61 person times.

Archive of Centre Records

Norm McCall continued the work in conjunction with Bob Duff to archive London Centre documents. The information is being sorted and stored on two identical solid-state disk drives. The archiving effort is ongoing.

Fingal Observatory Battery Upgrade

Under the direction of Norm McCall, the Centre undertook a maintenance project to upgrade the legacy battery system at the club's Fingal Dark Sky Observatory. The objective was to replace the existing system with a single 254 AHr AGM battery

The new battery was installed in late September. A voltage data recorder was installed to continuously monitor the battery to capture charge and discharge cycles to optimize charging parameters and ensure long-life and system reliability. The work to accurately benchmark the system has continued into 2022.

Fingal Observing Sessions

Under the direction of Dale Armstrong, the Centre held 25 observing sessions involving 14 members and their guests.

Observing Certificate Achievements

The London Centre actively encourages members to complete RASC Observing Certificates. This year Brian Parsons completed and received the Explore the Moon Certificate.

Member Astrophotography Pictures

The following are small sampling of the beautiful images taken by London Centre members in 2021.



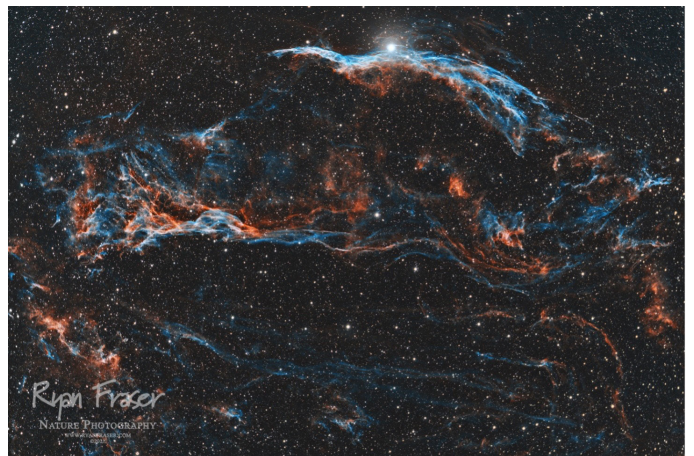
North America Nebula using Sky-Watcher Evostar 72ED with Canon T6i in London, Ontario, by Katlyn Beecroft.



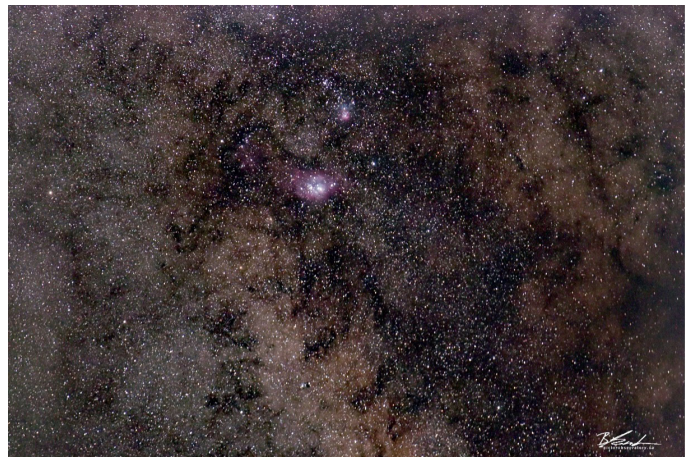
Soul Nebula using 80-mm Sky-Watcher Esprit with an ASI071MC, by Frank Sowa.



Moon & clouds taken at Fingal using a Panasonic G9 and Olympus 75mm @ F/2.8, ISO 400, by Dale Armstrong.



Sharpless 2-140 in Cepheus. Image consists of 5.5 hr in Ha and 2 hr each of RGB, by Ryan Frazer from his backyard observatory in London.



Lagoon and Trifid Nebula, Canon 80D, 400mm on a Sky Adventure, at Killarney by Bill Gardner.



Figure 6 Moon shot using an 8-inch Sky-Watcher Dob with a Samsung Galaxy phone, by Brian Parsons.

Summary

The London Centre Executive considers 2021 another successful year. We are proud of Member achievements in astrophotography and for their support in stimulating public interest in astronomy by hosting on-line Visual Astronomy events and maintaining a consistent Monthly Meeting schedule.

Centre members are excited about the prospects for 2022, as it marks our Centennial year since the founding of the London Centre on 1922 February 24.

Norman McCall
Secretary

MISSISSAUGA CENTRE

Due to the continuation of the COVID-19 pandemic, the Mississauga Centre continued with online programming in 2021. The Centre met twice a month (except in July, August, and December), alternating between Potpourri and Speaker Nights.

In 2021, the Centre hosted a variety of speakers with topics including the Canada-France-Hawaii Telescope, the Mars Sample

Return mission, Skylab, neutron stars and black holes, beginner telescopes, and RASC certifications. These virtual Speaker Nights attracted 50 to 60 participants per meeting, on average.

A number of members made virtual presentations at Potpourri Nights and covered topics such as the 2021 partial solar eclipse, the recurrent RS Ophiuchi nova, book reviews, postal history, visits to astronomy-related sites, and the Apollo missions. The year 2021 brought the exciting partial solar eclipse, the recurrent RS Ophiuchi nova, and comet Leonard to our skies. Our members, following pandemic rules, observed and photographed these memorable events, and our Centre email list was alive with their stories and wonderful photos.

Two Centre members were awarded RASC observing certificates Matteo Statti (Explore the Universe) and Swapna Shrivastava (Explore the Moon).

Mississauga Centre hosted eight Speaker Nights:

- | | |
|--------------|---|
| January 29 | Randy Attwood, "Apollo 14—A 50th Anniversary Retrospective of the Third Moon landing Mission" |
| February 26 | Steve Mallia, Ontario Telescopes—"Starfield Optics" |
| Mar 26 | Mary Beth Laychak, CFHT—"The Canada-France-Hawaii Telescope" |
| April 23 | Emily Carney, public speaker—"Skylab An Overview" |
| May 28 | Dr. Kim Tait, Royal Ontario Museum—"ROM Martian Meteorites and Mars Sample Return" |
| September 24 | Dr. Laurie Rousseau-Nepton, Resident astronomer at the Canada- France-Hawaii Observatory—"CFHT Learning on the Birth of the Stars with SITELLE" |
| October 29 | Dr. Michelle Thaller, NASA (Goddard Space Center)—"Space's Scariest Monsters, Neutron Stars and Black Holes" |
| November 10 | John A. Read, author and astronomer at the Burke-Gaffney Observatory,— "Getting the most out of your Beginner Telescope" |

The Centre hosted eleven Potpourri Nights:

- | | |
|-------------|---|
| January 15 | Kirby Alguire—"Photos of the Jupiter/Saturn Conjunction"; Chris Malicki—"The Sky for January and February"; Shakeel Anwar—"More Photos of the Jupiter/Saturn Conjunction"; Fred Benedikt—"Hunting for Meteorites Anyone can own one with patience" |
| February 12 | Simon Cloughton—"Apollo 14 A Postal History"; John Burgener—"A Consideration that the Fireballs Associated with the Perseid Meteor Shower are an Indication of a Previous Low Angle Skip Impact by Comet 109P/Swift-Tuttle"; Swapna Shrivastava—"A trip to the Canada-France-Hawaii Telescope"; Betty Robinson—"A Helicopter Lands on Mars"; and Dennis Gasparotto—"A Visit to Gordon's Park" |
| March 12 | Paul Taylor—"Paul and Gale's NASA Adventure"; Gary Crawford—"Rosette Nebula Astrophotography Project"; Leslie Strike—"The Sky by our Photographers-Astrophotography contest results!"; Ron Macnaughton—"Microbial mats on Earth and Mars"; Krishna Vedala—"Astronomy Logbook Software"; Allan Connery—"Telescope Loan Program" |

- April 9 Allan Connery—"Mississauga Centre Telescope Loan Program"; Simon Cloughton—"Berlet Electronics contribution to the building of the CFHT"; Fred Benedikt—"Travelogue Adler Planetarium & Lowell Observatory"; Ron Macnaughton—"Microbial mats on Earth and Perhaps Mars"; David Maynard—"Astrophotography on the Cheap"
- May 14 Randy Attwood—"The June 10 Solar Eclipse—What to Expect and how to Observe it Safely"; Simon Cloughton—"Skylab—The Beginning. A Philatelic History Part 1"; Randy Attwood, Kirby Alguire and Allan Connery—"The Mississauga Centre email Groups"; Randy Attwood—"The May 10, 1994 Annular Eclipse"
- June 11 Various Presenters—"Photos and Observation Reports from the June 11 Solar Eclipse"
- July 16 Shakeel Anwar—"June 10 Solar Eclipse"; Rick Veregin—"June 10, 2021, August 2017 Partial Solar Eclipses, February 1979 Total Solar Eclipse"; Kirby Alguire—"June 10 Solar Eclipse"; Shriya Naik—"A Visit to the Kortright Centre for Conservation"; Keith Jarvie—"Life on Venus? Living in the Extreme"
- August Meeting cancelled
- September 10 Matteo Statti—"A Review of the Star and Night Photography workshop run by Ariel Estulin"; Randy Attwood—"A review of the Apollo 15 mission which took place 50 years ago this past July"; Robert Neill—"How a modest, versatile, 86mm Newtonian can be modified by adding an altitude scale and modifying the table top mount to allow a tripod mount"; Chris Malicki—"The RS Ophiuchus Nova"
- October 15 Simon Cloughton—"Postal History of Apollo 15"; Adina Stan—"Visit to the Sulphur Mountain Cosmic Ray Station"; Dalisay Perez—"Aurora Borealis in Edmonton and on the Flight back"; Bhavishyaa Vignesh—"NASA Space Apps Competition / International Day of the Girl Conference"
- November 12 Shriya Naik—"A review of the book Advanced Skywatching—The backyard astronomer's guide to star hopping and exploring the universe"; Chris Malicki—"Recent Observations of the Proper

RASC website speaker and potpourri night postings

- Motion of 61 Cygni"; Shakeel Anwar—"Images of the November 3 Aurora"; John Burgener—"A New 3D Program to Simulate Comet Skip Impacts and the Possible Cause of the Carolina Bays as Secondary Debris Impacts"
- December 10 Fred Benedikt—"My Newtonian Collimation Procedure(s)"; Rick Veregin—"My Deep Sky Astrophotography Process and Recent Photo Examples"; Dennis Gasparotto—"A Quick review of the Askar ACL200 Astrophotography Lens"

Thanks to all the members who participated both in the virtual Speaker and Potpourri Meetings.

Centre Activities and Events

The Annual General Meeting was held on February 26, 2021.

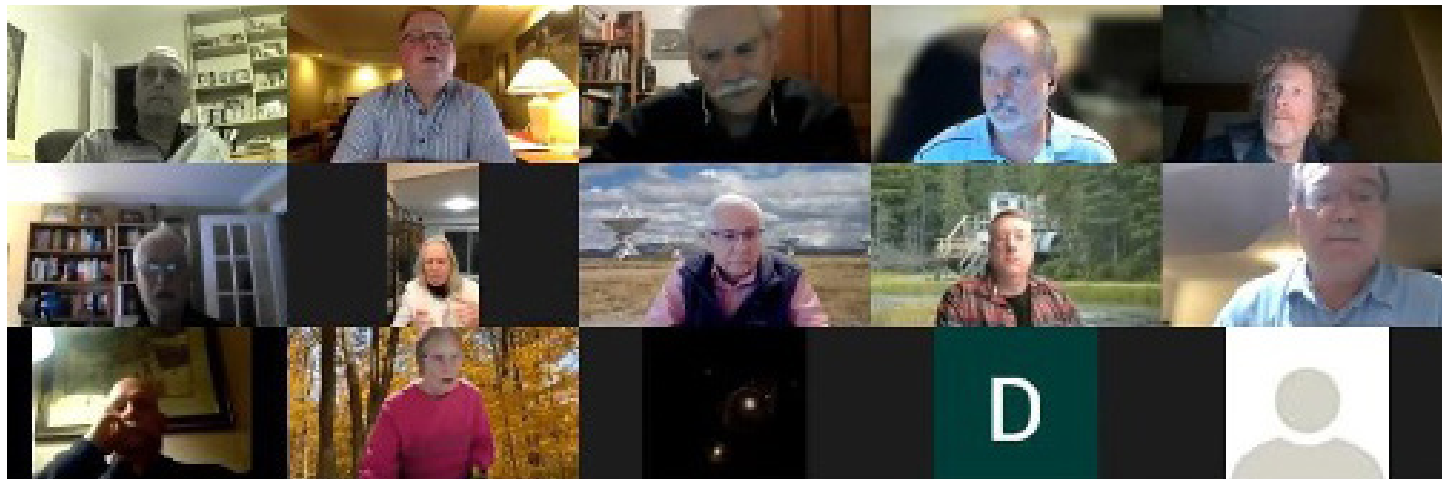
The Centre Policy Manual was updated and approved by Council in summer 2021. The policy update effort was led by Leslie Strike, Chris Malicki, and Keith Jarvie.

Two New Member Welcome Meetings were held in 2021—March 23 and June 8—to introduce new members to the RASC and the Mississauga Centre and to answer questions.

New Committees were created to help run the Centre and have more members involved in the workings of the Centre.

The Centre held the annual Astrophotography Contest, and prizes were awarded in the following categories:

Zoom Meetings



- Master Class Division Solar System winner was Shakeel Anwar;
- Master Class Division Nightscape winner was Dennis Gasparotto;
- Master Class Division Deep Sky winner was Shakeel Anwar;
- General Division Solar System winner was Gary Crawford;
- General Division Nightscape winner was Kirby Alguire;
- General Division Deep Sky winner was Gary Crawford; and
- General Division Smartphone winner was Anika Shrivastava Garrioch

The Centre telescope loan program, chaired by Allan Connery, has been very active throughout 2021.

The Mississauga Centre continued to sponsor the Mississauga Clear Sky Chart.

The Centre picnic, auction, and public outreach at Riverwood were not held due to the pandemic.

John Marchese, Membership Secretary, continually monitors the Centre’s membership. The Mississauga Centre currently has 207 active members.

The Centre’s budget and expenditures are actively updated and monitored by Anil Mathur, Treasurer.

Rob Neill continues to actively maintain the Centre’s website with updates and programming.

In 2021, the Program Committee (Randy Attwood, Swapna Shrivastava, and Anil Mathur) actively reached out to a number of speakers in both Canada and the United States to build the 2021–22 speaker lineup.

Council meetings are held quarterly.

Mississauga Centre Outreach Numbers for 2021

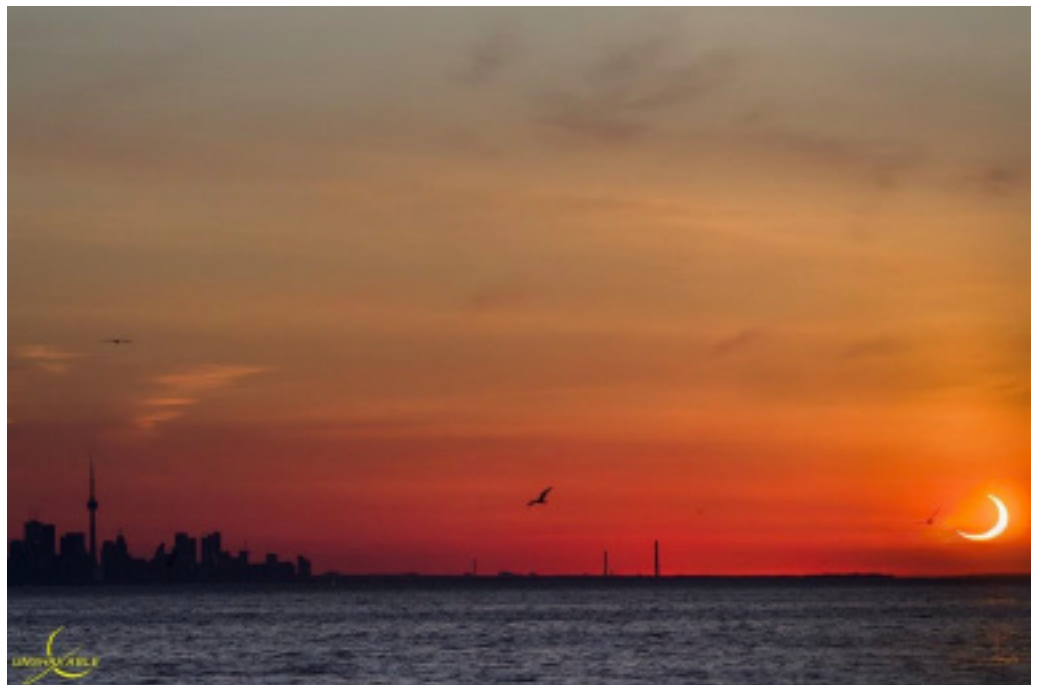
Our public outreach events were cancelled due to the COVID-19 pandemic.

Thank you to all the Centre Councillors, volunteers, and members for their involvement and enthusiasm.

Swapna Shrivastava
Secretary



The Great Orion Nebula. Captured from a light-polluted Bortle 8 backyard using an 80mm refractor, an ASI2600MM cooled astro camera, and 3nm narrowband filters. Photo by Adriano Almeida.



June Eclipse photo—Shakeel Anwar



November 19, 2021, lunar eclipse. Olympus m43 cameras near maximum eclipse. ISO200, 4 sec tracked exposure using a 60mm Takahashi APO f8.8 refractor. Photo by Brian Gibson

Master Class Division:
Master Class Division is open to members who have won a category in a contest previously.

Master Class Category: Solar System

Winner:



Photo by: Bradford Ainsworth

Object: Comet McNaught

Date Taken: Jul. 12, 2009

Location: Kingsport, Ontario

Equipment: Canon M3, Pentax 150mm F2 lens, Canon 50D/Tracker Pro

Processing: Stacks of 30, 40 sec exposures @ ISO 1600, stacking done in Sequator Colour, contrast and additional post-processing done in Photoshop

MONTRÉAL

CENTRE

A of New Year's Day 2021, the Montreal Centre had to continue its operations under COVID-19 restrictions. Our Clubhouse and Library remained closed and our dark-sky observing site (Woolly Woods) remained inaccessible for all of 2021. However, after June 30, we were allowed to access the land around our Clubhouse for observing and at our second dark-sky site, Thompson Park, Hudson, Québec, with a maximum of 25 members.

Our observing at the Arboretum started on Wednesday, June 30, and ended Wednesday, December 1. There were 18 events, but only 2 were a "go."

Public & Outreach Events

- January 26 An Evening of Exoplanets by multiple presenters.
- February 10 International Day of Women and Girls in Science organized by Virginia Pacheco.
- February 18 History of Mars Exploration—Beaurepaire Beaconsfield Historical Society presented by David Shuman (outreach)
- February 27 The Search for Life on Mars, presented by Dr. Richard Léveillé.
- March 5 Beaconsfield Public Library Alien Drawing Bilingual Workshop by Taara Jaffer (Outreach).
- March 19 Outreach Event Beaconsfield Public Library Mars 2020 English Presentation with Bilingual Q&A by Adrien Blanchet (Outreach).

RASC Montreal Centre Presents a Zoom Public Event



Astrophotography From Simple to Advanced

Saturday, March 27th 2021 7pm EDT

From wide field nightscapes to high resolution photos of nebulae or far off galaxies, every image is an adventure with a story to be told.

Learn what it takes to capture the beauty of the heavens, from the challenges setting up a camera on a tripod to orchestrating equipment in a permanent observatory.

Register for this Free Zoom Event
<http://bit.ly/3kXYrSo>




Debra Ceravolo
Published Astrophotographer
RASC Okanagan Centre Member



Bubble Nebula (NGC 7635)

Celebrate Earth Hour following the event!

March 27 Astrophotography From Simple to Advanced by Debra Ceravolo.

RASC Montreal Centre Presents a Free Zoom Public Event



Small Satellites, Big Stars

Studying Massive Stars using BRITE Constellation

Saturday, April 24th 2021 8pm EDT



Launched in 2013-2014, the independent BRITE nanosats continue to produce excellent science data, observing variable properties of a the brighter visible stars in the sky - over 700 stars to date.

Equipped with a 30 mm telescope and an uncooled CCD detector along with either a blue or red optical filter, a 24 degree field of view provides observations of up to 30 stars simultaneously by each nanosat...allowing astronomers to probe the interior and surface structure of bright, "BIG" stars and binary star systems.

Register in advance for this Webinar:
<http://bit.ly/BRITE2021>

<http://www.rascmontreal.org/moon/our-calendar/>



Dr. Anthony (Tony) Moffat
Emeritus Professor, UAlberta

- April 24 Small Satellites and Big Stars by Dr. Anthony Moffat
- May 8 Virtual Swap Table by the Montréal Centre.
- May 15 Global Star Party by the Montréal Centre & Explore Alliance (outreach).
- June 5 Encouraging Girls into STEM Fields by Fusing Art and Astrobiology by Bettina Forget.
- Jun 10 Annular Solar Eclipse (A backyard outreach observing event).

- July 17 Quick Astrophotography Under A Light Polluted Sky by Steve Warbis
- July 31 Stunning Star Trails by Mary McIntyre.
- August 6 Beaconsfield Public Library—The Perseid Meteor Shower. (Outreach)
- August 14 Star Party Centennial Park Beaconsfield organized by Karim Jaffer & Russell Fralich. (Outreach)
- August 15 45-Degree Outreach Star Party John Abbott College organized by Karim Jaffer.
- August 19-21 Partners Event Astronomy League Convention. (Outreach)
- August 21 Solar sphere Festival UK organized by Peter Williamson.

- December 4 Apollo Science Missions by David Shuman.
- December 10 Zoom Outreach Event astroMIL Winter Edition—Université de Montréal—Multiple Presenters (in French). (Outreach)
- December 14 Outreach Observing Event—The Geminid Meteor Shower—Fritz Farm Baie d'Urfé.

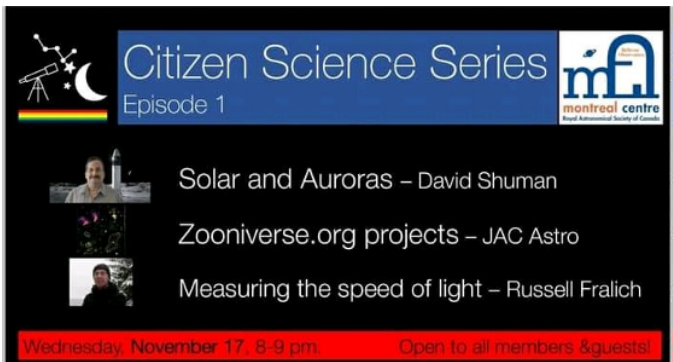
Presentations for Members

- January 6 The Night Sky for January by Nicole Laporte
- January 20 Space Flights by David Shuman
- February 3 The Night Sky for February by Nicole Laporte
- February 17 Measuring Double Stars Using Astrophotography by Dominique MacKenzie.
- February 24 The Night Sky for March by Nicole Laporte
- March 10 Focus and Collimation by Greg Beaton.
- March 24 Chinese and Russian Launch Vehicles by David Shuman
- March 31 The Night Sky for April by Nicole Laporte
- April 14 Choosing a Camera for Astrophotography by Ben Shu Chang.
- May 5 The Night Sky for May by Nicole Laporte
- May 19 "Getting Started in Backyard Astrophotography during Lockdown" by Russell Fralich .
- May 26 The Night Sky for June by Nicole Laporte
- June 2 "Whirlpools in Space The Story of the Leviathan Telescope in Ireland" by Peter Williamson .
- June 9 "Indigenous and Ancient Eclipse Legends" by Karim Jaffer and "An Eclipse Road Trip" David Shuman.
- June 23 Astronomy Gadgetry by Karl Petruich.
- July 21 The Chinese Space Program by David Shuman.
- August 18 Orbits Are (Not [Quite]) Ellipses» by Pierre Paquette.
- September 22 "All About Siril In A Nut Shell" by Jane Lubenskyi.
- October 20 Babylonian Planetary Theory by Pierre Paquette.
- November 13 RASC Montreal Centre's AGM chaired by President Paul Simard.

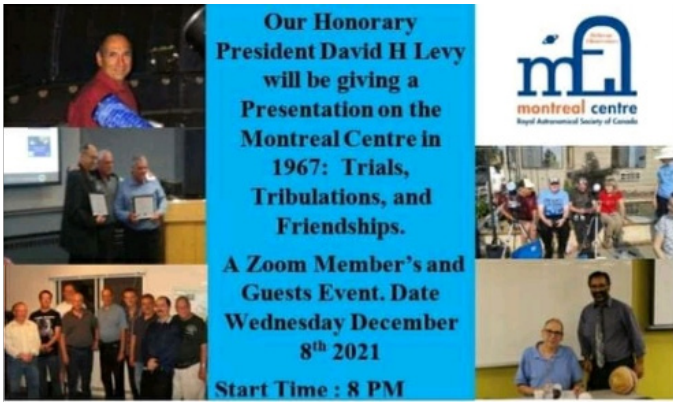
- September 18 Townsend Lecture 2021—Two Weeks on "Mars" by Elizabeth Howell, Ph.D.
- September 25 45-Degree Outreach Star Party with the Montréal Centre, Dunedin Astronomical Society, and Explore Alliance.

- October 16 International Observe the Moon Day—Solar System Moons, Centre member and Astronomical League VP Chuck Allen.

- October 29 Zoom Spooky Nights, with JAC Space Club. (Outreach)



November 17 Citizen Science Episode 1, with 3 Speakers



December 8 The Montréal Centre in 1967 Trials, Tribulations, and Friendships by Dr. David H. Levy

NEW BRUNSWICK

CENTRE

I have contacted the Society office to get an exact list of membership at the end of our fiscal year and waiting for their answer. With Membership help, we tried Driven, and can't seem to access the report, but I did locate the number as of this month which is 89.

During this Covid Pandemic, we had monthly meetings on Zoom, with attendance ranging from 10 to 24.

Public outreach is totally cancelled, but a few members had Zoom connections with schools doing presentations, and our local member Chris Curwin is hosting a weekly show called Astronomy by the Bay on Facebook and YouTube, which is very popular, reaching over 60,000 on live feeds.

The process of obtaining charitable status for RASC NB Inc. is final. We are awaiting CRA's response to our reports.

Hoping to return to regular in person meetings, and public outreach!

Our star parties are scheduled for 2022....

Emma MacPhee
Secretary

NIAGARA

CENTRE

We restarted public events in August at one of our most popular locations, Firemen's Park in Niagara Falls. We continued monthly stargazing events through November. Attendees had to maintain social distancing and wear masks to look through our telescopes. Attendance was mixed.

We could not hold monthly general meetings in our usual room at the Niagara Falls library. All our monthly general and executive meetings were on Zoom. We felt that we had a great variety of guest speakers.

Our membership remained steady in the low 90s. This reflected members leaving the club, as well as gaining new members, and former members rejoining the club.

Our members' observatory remained open with social distancing regulations. Monthly members' nights at the observatory were able to continue. Several work parties did a lot of repairs and upgrades.

The partial solar eclipse in June was the year's observing highlight. Many club members enjoyed it from various locations, on a warm, nearly cloud-free morning. No public or private club events were held for the eclipse, due to the pandemic regulations in place on that day.

We published our own 2022 calendar, featuring pictures from our members. Fifty copies were sold.

Our expert craftsman John VanderBrugge has been building a truss Dob around an old but excellent 17.5-inch Coulter mirror. It will be ready for use in 2022. It has Sky Commander digital setting



Rebuild around a 17.5 inch Coulter mirror.
Photo by Bob Lewis.



"2021 June 10, solar eclipse from Port Weller, Ontario."
Photo by Robert Lenz

circles, dew heaters, and motors on the collimation knobs with a remote!!

Awesome job John!!

RASC Niagara guest speakers 2021

January	Robert Jedicke, Asteroid Mining
February	Philip Downey, Astronomy Pub Quiz
March	Pauline Horton, National activities
April	Peter Jedicke, Globular Clusters
May	Malcolm Park, Atacama Desert Observing and Astrophotography
June	Alan Dyer movie
September	Mariek Schmidt, Mars
October	Alan Friedman, Minimum to the Max, Solar Astrophotography
November	Glen Pidsadnick, Astrophotography in the Blue Braille Observatory
December	Robert Jedicke, Einstein vs. Santa

Phil Downey,
Secretary

Robert Lewis
Treasurer

GENERAL

The Okanagan Centre has regular meetings across the Southern Interior of British Columbia. The Center is organized into three meeting groups to accommodate the three major population centers of Vernon, Kelowna, and Penticton. Each group holds monthly meetings and outreach events in their local areas, and all three meet together for the AGM, an Annual Fundraising Dinner, and many observing events. The Centre operates the Okanagan Observatory, 40 kilometres southeast of Kelowna, near Big White Ski Resort. Our membership in December 2021 was 134, a decrease contributed to limited outreach and events due to COVID-19 restrictions.

NOTEWORTHY

Members Andrew Bennet and Zoltan Boda, for their years of service to our club, were recipients of the National Service Award.

Our custom is to announce the Okanagan Centre's member of the year award at the Annual Fundraising Dinner. As this event was cancelled in 2020 and 2021, we announced the recipients at our AGM held over Zoom in March 2021. Member of the Year 2019 was Christine Janzen. Member of the Year 2020 was Guy Mackie.

MEETING GROUPS AND OUTREACH ACTIVITIES

MONTHLY MEETINGS

The Okanagan Centre began meetings in March 2021, which were held online via Zoom due to COVID-19. Members continued to keep in touch via our news group, with informal posts and members sharing observations and online events.

OUTREACH

Led by coordinator Colleen O'Hare and due to COVID-19, the Kelowna group only did Zoom presentations this past year. We presented to 8 schools (total guests 69, youth guests 58), 2 Okanagan Regional Library Summer Reading Club visits (total guests 80, youth guests 67), and a Teacher Summer Conference (total guests 15). There were no public events held at the Okanagan Observatory. Our total guests for 2021 equals 154 with 125 being youth guests.

OKANAGAN OBSERVATORY

Due to pandemic restrictions the Okanagan Observatory was once again unable to deliver the public program in 2021.

Some enhancements were made to infrastructure elements, and continued progress was made in development of the radio astronomy program.

ANNUAL FUNDRAISING DINNER

This event was cancelled for 2021. The committee expects to continue with this Annual event once health measures ensure it will be safe to do so.

Christine Janzen
Secretary

Assuming the presidency in the middle of a pandemic has brought its own unique set of challenges to the position and to the Centre. Fortunately, I have had the help and support of a fabulous team of volunteers. Here I am not only talking about my fellow council members and the “named” volunteers in various appointed positions, but everyone who has rolled up their sleeves and pitched in in so many ways. Naming everyone would simply take too long, and I know I would be sure to overlook someone if I tried. So instead please simply accept my gratitude.

I continue to be amazed at the talented individuals within our Centre. Not only with the stunning quality of the astronomical images but in so many other ways. Some members are regular contributors to “citizen science,” initiatives providing valuable data to the research community. Others are designing and building their own astronomical equipment, circuitry, and programs. There are several home “remote” observatories in the area. The knowledge is readily evident in the talks given and the advice freely provided in the email exchanges, both of which make our astronomical community stronger.

We are fortunate as well to be in good financial shape, which has enabled us to continue improving how we can serve our members. The two main areas here are at the Fred Lossing Observatory (FLO) and our website, both of which I will touch on later in this report.

Ongoing COVID-9 restrictions required us to continue having our monthly meetings virtually. Thank- fully our Meeting Chair, Dave Chisholm, and Chris Teron on the technical side have got the process down pat and the operation is running smoothly over Zoom. A big thank you to RASC National for the use of their Zoom account for hosting. Our initial high numbers of virtual participants have settled back though and are we now holding steady at roughly pre COVID-19 levels. A likely result of “Zoom fatigue” and the desire to once again have physical meetings with the additional interaction attendant with them.

Also flourishing, despite the pandemic, is our monthly newsletter AstroNotes. Our Editor, Gordon Webster, somehow manages to source an ever-increasing number of interesting articles and keeps things fresh.

Similarly COVID-19 restrictions scuttled our Annual Dinner Meeting for the second year and has forced a continued cancellation of our very popular public star parties. We remain hopeful that when the warmer weather returns in 2022, so can they. With vaccination numbers increasing and the easing of some restrictions, we have held some distanced member star parties at FLO in the latter part of this year. That is of course when the weather also cooperates! Despite the restrictions Dave Chisholm has continued with his remarkable virtual outreach program enhancing the lives of over 270 youth and 30 adults this year.

Speaking of FLO, 2021 marked the 50th anniversary of its establishment, an event celebrated on September 11 with a get together by over 75 people. The main architects of this great event were Gordon Webster and Rich Scholes, although as usual they had a lot of assistance. Music, telescope clinics, sketching workshops, observatory tours, conversation, and equipment demonstrations filled the day, all topped off with a bar-b-que and, of course, cake. The good news being the rain held off, the bad news being things ended earlier than hoped as the cloudy skies did not allow for viewing. Nevertheless a great time was had by all. Did I mention there was cake?

The original Fred Lossing 16-inch telescope also turned 50 years old this year. Although retired from service at FLO in 2017, it has now found new life at the North Frontenac dark-sky site. Provided by the Ottawa Centre on permanent loan to the Township of North Frontenac, it has been lovingly restored by them and installed in a new purpose-built observatory at the site. Public first light was at a ceremony there on August 14, which I was fortunate enough to attend along with a few other Ottawa Centre members—especially as there was, you guessed it, cake.

Continuing with the FLO theme, thanks to our Observatory Director, Rick Scholes and a host of volunteers, it has had another exceptional year of maintenance, upgrades, and installations. The entrance road has never been so good after the brushing and additional gravel work. The issues with the Paul Comison telescope systems have been resolved and the Rolf Meir telescope is happily installed in its relocated observatory. There are new side guides on the Mike Wirth telescope’s roll-off roof, new electrical panel, power to the Paul Comison telescope and the Rolf Meir telescope, and the observing mounds have been expanded and improved—and that’s just the major items!

Looking to make a decision on heading out to FLO for some observing, well there is now a new aid to help you out? Head over to paquette.dyndns.org/FLO/index.html. There you will find Andre Paquette is now displaying the output from his personal weather station located less than a kilometre away. Also conveniently on the same page is the FLO Clear Sky Chart (thank you Attila Danko) and current satellite imagery, giving you all the decision-making tools in one convenient location.

Sadly in this report I also have to mention the passing of three members since the last President’s report, Thomas Wray, Michael James, and Paul Sheppard. They will be missed.

The Ottawa Centre has been taking an active role in ensuring the former Dominion Observatory (DO) on Carling Avenue here in Ottawa suffers as minimal impact as possible from the proposed new Ottawa General Hospital campus being constructed adjacent to it. A dedicated group of volunteers has done tremendous work in documenting the history of the DO, attending planning meetings, lobbying politicians, making applications for historical designations, along with other efforts. I am pleased to say at this time it appears that things are looking positive although, as usual, some work remains to bring things to a conclusion.

I would like to thank Mick Wilson for the tremendous effort put into the Centre website. If you have not been on it lately, I encourage you to take a look. The breadth and depth of the content available on it is truly amazing. Equally amazing to me is the way that it is indexed, cross referenced, and searchable. I still don’t have full grasp of what it is capable of. Check it out for yourself.

A few years back, the wheels were put in motion to give special recognition to the many years Brian McCullough has given the Ottawa Centre, astronomy education, and public outreach. It was with great satisfaction that this year we finally saw him honoured with an asteroid named after him. Somewhere out in the main asteroid belt lies asteroid 10059 McCullough (1988 FS2). I look forward to seeing the first image of it to be shown in our monthly meeting observations.

Way back when we were able to have in-person meetings, a fixture of the meetings was the coffee, drinks, and treats served up by Art and Ann Fraser at their conclusion. There was never a time I could not remember them being there. Turns out that would be because they had been doing it for 40 years! They have now decided it is time to step away from the coffee pot and let someone else continue the tradition. They will forever be one of my fond

memories. And on that note, I will conclude my President's report, with a tip of the hat to Art and Ann and a hearty thank you for all that you have done over the years and continue to do for the Centre. In person, there would have been cake!

Stephen Nourse
President

PRINCE GEORGE CENTRE

2021 has been a very quiet year due to the pandemic.

However, on March 19 there was a Zoom presentation by Malhar Kendurkar, PG president, titled Transient Universe—The Cosmic Fireworks.

On March 27, Malhar, at the DAO in Victoria, did a Zoom presentation titled GSNST: A Sky Survey for Transients using an Array of Robotic Telescopes.

Chris Gainor did a Zoom presentation on April 16.

Monthly business meetings via Zoom are held.

The Robotic Telescope Project (RTP) was formed in October with the intention of making the 24-inch telescope capable of remote operation. We are collaborating with Dave Lane of the Halifax Centre. Dave has built or converted three observatories capable of remote operation. The committee meets biweekly.

Glen Harris
Secretary/Treasurer

REGINA CENTRE

2021 was another year of pandemic restrictions that limited activities within the Regina Centre. Nevertheless, that did not stop our members from doing their own observing when weather permitted. We had a couple members, Denis Pilon and Darnell Ogrodnick, receive observing certificates last year, which is always inspiring to see. While our public outreach program was deemed a risk for our members, we did hold the Saskatchewan Summer Star Party last August in Cypress Hills. It was very well attended and with everyone practising social distancing, it was a memorable weekend with fellow astronomers from all over Western Canada.

We were also able to give special recognition to one of our long-term members, Ross Parker, by having an asteroid named after him for all his contributions to the Centre. 10084 RossParker is now officially named by the International Astronomical Union and Ross now joins a handful of Regina Centre members that have celestial objects named after them.

Last year, we were enlightened by many speakers at our monthly meetings. I would have to say that my favourite was Dr. Lauchie Scott from Defence Research and Development Canada. It was great to see the kind of research Canada is doing in space

and how it contributes to knowledge share between other countries. Very awesome!

Looking forward into 2022, we are expecting to return to our in-person meetings at the Science Centre while continuing to offer them as Zoom meetings for our members unable to travel. We currently do not have access to the small theatre in the Science Centre as they are undergoing renovations, but we should be back in business by late spring. For two years, our public outreach programs have been closed but the great news is that we will be starting up again and should be opening the Kalium Observatory again in late spring.

In addition to the outreach, we're also looking at a couple of club events to bring members together to share some good times and take in the beautiful views of the Universe. There will be opportunities to volunteer this year in several different ways. We have some repairs that need to be done at our dark-site property outside Regina. By then, the Saskatchewan Summer Star Party will be right around the corner with this year being the 25th anniversary!

I also want to take this opportunity to thank all our council members for volunteering their time and talents to the Society and to thank all of our members who will be volunteering in the upcoming year. I'm looking forward to working and observing with all of you this year. Keep looking up!

Clear Skies,

Vance Petriew
President

SASKATOON CENTRE

Continuing COVID-19 created a somewhat subdued year for the Saskatoon Centre with respect to public outreach and General meeting attendance, but we managed.

We were proud to have Service Awards presented to Les Dickson, Ellen Dickson, Ron Waldron, and Darrell Chatfield for all of the phenomenal work they have done for our Centre over the years. Rick Huziak also was nominated by Dr. Gord Sarty of the University of Saskatchewan and Dr. Judith Irwin of the Canadian Space Agency and accepted by the International Astronomical Union as Canada's first Honorary Member of the IAU.

Other member contributions this year included Colin Chatfield & Tim Yaworski, featured on a TV appearance for Dark-sky Week. Jeff Swick and Tim Yaworski started up a narrow-band imaging group at Sleaford Observatory. Yannis Pahatourglou managed to overhaul and fix the issues on our 16-inch Meade telescope, which was experiencing a nervous breakdown for much of the last decade. Ike Thiessen revamped the Telescope Rental Program.

Sleaford Observatory remained well used throughout the year; we held a work bee to do annual maintenance, which included a purge of unused junk from the storage shed and repair and staining of the observatory deck. The observatory also scored a new used riding lawnmower.

This year we managed to hold the 24th Saskatchewan Summer Star Party at Cypress Hills Inter-Provincial Park (August 4 to 9) after last year's COVID-driven party cancellation. This year we ran with COVID protocols in place (masking in enclosed areas, hand sani-

tizing, all outdoor programming, and no group meals) and had an amazing attendance of 290, whereas our non-COVID years attract around 330. So, we did very well! Although smoke from B.C. wildfires was a significant nuisance at times, we did get a few decent observing nights. Programming included 10- and 20-year awards, Astrophoto, Sketching, Art Contest awards, short talks and door prize draws. The Fr. Lucian Kemble Memorial lecture was given by Dr. Samantha Lawler (Univ. of Regina) who presented her research on the negative effects of the mega-constellations of internet satellites. Clinics were a Binocular Star-walk by Murray Paulson and Astro-sketching by Sherry Campbell (both Edmonton Centre). The main organizers were, from Saskatoon Centre, Les & Ellen Dickson, Rick Huziak, Donna-Lee May, George Charpentier, Darrell Chatfield, Greg Fusick, Ron Waldron, and Andrew Kostiuk and, from Regina Centre, Pierre Schierle, Vance Petriew, and Laura Egler, assisted by about 35 other volunteers at the star party. Ottawa-based journalist Suzannah Showler, who was interested in doing an article on dark skies, also attended SSSP on her way to Grasslands National Park Dark-Sky Preserve.

With a slight lull in COVID numbers we were able to conduct a few public events over the summer. Ron Waldron gave a talk at Pike Lake Provincial Park (August 12) with Mike Dolan, Colin Chatfield, and Tara Magee in tow, though the sky was cloudy. Rick Huziak, Colin, and Tara provided a talk and telescope time at Blackstrap Provincial Park (August 14) under an excellent clear sky.

Light-pollution abatement work continued around the province. Rick Huziak visited Grasslands Dark-Sky Preserve (August 27) to do a light audit and create a re-lamping plan with park management. A light-pollution talk was given by Rick at Cypress Hills Dark-Sky Preserve (August 28.)

All programming for our monthly Centre meetings was via Zoom due to COVID-19 restrictions, as follows

Jan.	Murray Paulson (Edmonton Centre)—Mars 2020—The Great Mars Apparition
Feb.	Rick Huziak—The RASC's 2021 Night Sky Almanac—A Book Report Tim Yaworski—National Astrophotography Certificate Program
Mar.	Ron Waldron & Mike Dolan—Astronomical Jeopardy A Game for Astronomers
Apr.	Colin Chatfield & Tara Magee—The Upcoming Sky Daryl Janzen—Discovery of SN 2021gmj and other great stuff
May	Colin Chatfield & Tara Magee—The Upcoming Sky Tenho Tuomi—Photographing Emission Nebulae with a Modified Canon Camera Rick Huziak—The Amazing Nova Cassiopeia 2021
Jun.	Colin Chatfield & Tara Magee—The Upcoming Sky Ron Waldron—The Possibility of Life in the Universe
Sep.	Colin Chatfield & Tara Magee—The Upcoming Sky Rick Huziak—New Challenges in Light Pollution in Saskatoon Les Dickson—SSSP'21 in Pictures
Oct.	Colin Chatfield & Tara Magee—The Upcoming Sky AGM and Elections
Nov.	Colin Chatfield & Tara Magee—The Upcoming Sky Jeff Swick—The New Narrow-band Imaging Group

Dec. Colin Chatfield & Tara Magee—The Upcoming Sky
Ron Waldron—Saskatchewan Starry Skies—a
Personal Perspective

Rick Huziak
Secretary

SUNSHINE COAST CENTRE

For the Sunshine Coast Centre, in common with other clubs, 2021 was another challenging year in view of the continuing COVID pandemic.

Our Executive met ten times over Zoom during 2021. At the October AGM, it was with regret that we said goodbye to our esteemed treasurer, who retired after efficiently re-organizing the accounting system. One new member was elected to the Board. In the absence of any nominations for position of Treasurer, one of the existing Board members agreed to take on the role.

The Sechelt airport expansion meant our old our access route to the observatory was no longer available. This change involved correspondence with the Sechelt Council and several officials. The result is that we have a new access route shown on a map posted on our website.

While during 2021 members performed routine upkeep of the observatory, COVID rendered in-person activities at the site impractical. We were however able to participate at an in-person event with a booth at the re-opening of the Sechelt Airport that generated considerable public interest. We presented various solar scopes, with one having a display set up so that members of the public were able to observe a live solar flare onscreen without risk of close contact.

Despite the challenges of COVID, we managed nevertheless to remain active, mostly using remote techniques. We had ten monthly Zoom meetings with six guest lecturers on subjects including cosmology, astrogeology, and astrobiology.

We had lectures from our own members, including a talk on ancient skies, a presentation on observing the Sun and the aurora, and a presentation on navigation techniques over the ages. We emphasized hands-on astronomy by way of the Explore the Universe challenges presented by one of our Board members.

We introduced the concept of members giving short informal presentations at our monthly meetings to discuss their equipment or activities. This has proved to be a popular addition to our monthly presentations.

We created a YouTube channel with guest lectures and member lectures, noting that one member had received over 500 hits for his member presentation. The popular Sky-this-Month series, which includes topics related to general astronomical principles, is also posted.

The Sunshine Coast Centre had a global outreach with members attending from other Centres. We also maintained an outreach contact with Harry Andinda in Uganda, to whom we have sent a telescope and other equipment. We conducted an interview with him, which is posted on the YouTube channel.

We instituted a policy to follow up with members who had not renewed to find out the reason. This process has been facilitated

with the transition to the new RASC new membership database. Despite the challenges last year we were able to hold the membership steady around 41 members.

The club was active on social media and in the press with one Board member contributing a monthly column to the local newspaper.

We also made images of the covers of our library books available on the club website to facilitate online browsing of the collection.

A planned in-person meeting for December was cancelled in part due to the unexpected rise in COVID infections and in part due to the failure of the venue heating facilities. It is of course hoped that we will be able to resume in-person activities in 2022.

We will be continuing with efforts in the areas of outreach, membership, diversity, accessibility, and community enhancement, and we look forward to another successful year in 2022.

Richard Mitchell
Secretary

ST JOHN'S CENTRE

The membership year for the St. John's Centre of the RASC runs from October's Annual General Meeting through to the following September with a meeting each month except for July and August. Over the year spanning October 2020 to September 2021, the St. John's Centre continued its schedule of lively monthly meetings, open to the public, by taking advantage of the RASC Zoom account. In-person meetings and group observing sessions were substantially limited by pandemic restrictions, but members did interact extensively using a very active email/chat group hosted on Groups.io.

The RASC Zoom Account has been very helpful for the Centre. In addition to facilitating our monthly meetings, it has provided a number of unanticipated additional benefits. It has given us an ability to record meetings and make them available to a wider audience, and to members from outside of the city, using our Centre YouTube channel. It has also enabled members to attend other RASC online events, including meetings hosted by other Centres. Of particular note, it has given us a way to host remote talks by speakers who would not normally be accessible to our members in St. John's. As noted below, we have made extensive use of this capability and our members have been able to benefit from a number of excellent presentations by leading-edge astronomers and scientists.

The Centre maintains a substantial internet presence via our webpage (stjohnsrasc.ca), our YouTube channel, Twitter, Instagram, and Facebook. This presence continues to support a renewed interest in astronomy and an enhanced public awareness of our activities. An active group of members continues to work on improving their astrophotography skills with very impressive results. This activity is encouraged and supported by the lively exchange of ideas, comments, and suggestions on our e-mail discussion list. This list has been instrumental in helping many members explore astrophotography for the first time and exposing newer astrophotographers to more advanced techniques. This forum has also been used extensively to report visual observations to other members and to alert members of interesting astronomical events.

Member engagement has been supported by a number of formal and informal initiatives. In December 2020, an astronomy-themed Christmas card, with images from various Centre activities, was sent to all members. A Centre newsletter, with contributions from many members, was revived and distributed periodically to all Centre members. Throughout the year, some members also hosted online observing sessions, using various platforms like Google Meet, where other members could see views through a connected telescope, share technical insights about observation and astrophotography, and socialize in a physically distanced way.

In Spring 2021, when there were some encouraging signs regarding the trajectory of the pandemic, the Centre executive started to think about the possibility of carefully re-introducing some public outreach events using video-connected telescopes to enable observation while maintaining physical distancing. The first two events that were considered were for the May 15 Astronomy Day and the partial solar eclipse on June 10. It was decided to try to offer a scaled-down version of an Astronomy Day event in conjunction with the Geocentre at Memorial University's Signal Hill campus before making any decision on the June event. For the observing part of our Astronomy Day event, a solar telescope was set up within a roped-off area. The view through the telescope was displayed on a monitor at the edge of that area. Inside the Geocentre, a very small contingent of members interacted with visitors, at a distance from behind a barricade, by displaying telescopes and providing literature handouts. Visitors could also view a meteorite display and view a live feed of the Astronomy Day activities provided by the Ottawa Centre. As it turned out, the sky was largely overcast but the event did demonstrate the challenges of using video monitors to display telescope views even in modest sunlight. An additional challenge was the effect of wind on structures used to shade laptop and computer monitors.

At the time of the Astronomy Day event, vaccination had just begun and only members who had already had at least one COVID-19 vaccine shot participated in the event. Visitor numbers in the building were restricted in density according to guidelines in effect at that time. About 120 visitors passed through the indoor display. There was some concern, a few days later, when it was learned that one of the children in attendance at the Astronomy Day event had been exposed to COVID-19 at school. Fortunately, the child and the child's family all tested negative and there were no further issues arising from this event.

After looking into the obligations we would have to monitor and restrict attendance at a public event at the Parks Canada site on Signal Hill, it was decided that we could not offer to host an early morning public event for the June 10 partial solar eclipse. We then investigated the possibility of hosting a livestream of the event using our YouTube channel. A test of our livestreaming options was carried out a few days in advance but on the evening before, it was apparent that the weather would not permit any viewing and we did not proceed with a livestream event. On June 10, Garry Dymond did a 7:00 a.m. interview about the eclipse on a local radio station. Members travelled to different locations on the Avalon Peninsula in an attempt to see the eclipse through holes in the cloud cover, but there were no reports of local success.

Due to pandemic restrictions, we did not organize our normal summer star parties at Butterpot Provincial Park or Terra Nova National Park. The staff at Terra Nova organized an event on light pollution and the park's Dark-Sky Preserve status for August 26/27. As the pandemic outlook appeared to improve later in the summer, we started planning for a September public viewing event at Admiralty House in Mount Pearl. Again, the plan was to have a small number of telescopes set up for electronic viewing with a monitor. Near the end of August, some members of the Centre executive held

a planning meeting with the event coordinator. As it turned out, the evening for which the event was planned coincided with the arrival of Hurricane Larry and damage to the grounds of Admiralty House precluded rescheduling to a later date in September and the event was postponed to a future date.

The online format of our monthly member meetings enabled us to program a much wider range of speakers than would be possible under normal circumstances and we were fortunate to be able to host a particularly exciting and varied series of talks as well as an Open Forum for members during the year. Our meeting highlights were as follows;

October	In addition to our Annual General Meeting, with the annual election of officers, Garry Dymond presented a talk on “Observing Mars.”
November	Peter Jedicke (London Centre) presented a talk on “Assessing the Asteroid Threat ... and more”.
December	Kim Hay (Kingston Centre) presented a talk entitled “Solar Observing—Becoming a Citizen Scientist.”
January	Collin Knight (Western University) presented a talk entitled “Mid-Infrared Observation of Nearby Galactic Nebulae.”
February	This meeting was a Member’s Night where members give short talks about topics of interest to them. Topics covered included impact detection on Jupiter as an example of citizen science, a collection of Soviet-era space pins, astronomy on stamps, a summary of online astronomy courses offered at the Grenfell campus of Memorial University, and a member’s hydrogen-I radio telescope.
March	Members Chris Stevenson and Phil McCausland talked about three missions, Al-Amal, Tianwen 1, and Perseverance that had recently arrived at Mars. We also had a talk from from Shaziana Kederali on two outreach projects, the Yuri’s Night Celebration and Canada Moon.
April 2021	Anna O’Grady (University of Toronto and previous St. John’s Centre member) presented a talk entitled “Identifying the first population of super-Asymptotic-Giant-Branch stars” in which she described a breakthrough in her research that has attracted considerable attention.
May 2021	Dr. Don Bedard (Senior Defense Scientist in the Space Systems Group, Defense Research and Development Canada) presented a talk entitled “Space Surveillance and the Intelsat 10-02 servicing mission” which described an ongoing project for which Centre member Jim Johnston has been providing photometry measurements.
June	This meeting was Open Member’s Forum at which members talked about previous observations of solar eclipses, including reports from elsewhere on the June 2021 partial solar eclipse, and about expectations for the upcoming 2024 solar eclipse.
September	Dr. Chris Herd (University of Alberta and a NASA Returned Sample Scientist) gave a talk describing the Mars Perseverance Rover mission.

In addition to the highlighted presentations and activities described above, each meeting also featured a session in which members described recent observations, often illustrated by their

photographs, and a session in which our Observing Director outlined the observing opportunities for the upcoming month. Following the formal portion of each meeting, many members stayed online to socialize and discuss their astronomy activities.

The Centre makes extensive use of RASC-developed material (*SkyNews*, *Star Finders*, *Moon Gazer’s Guides*, etc.) at all outreach events and other interactions the public. We are a small Centre but have normally managed to replace fall-offs with new members, both young and old. Maintaining membership presented more of a challenge as the Pandemic started but membership is again rising as we emerge from the Pandemic.

Members of the Centre are excited by opportunities to share their love of astronomy with members of the public and enjoy helping people discover and develop their interest in the sky. We note that the pandemic has brought a renewed interest in astronomy and beginner telescopes. Unfortunately, it has also resulted in a limited supply and some disappointments. When we have been asked about setting up new telescopes, we have tried to help as much as possible under the circumstances. We look forward to resuming events where we can introduce members of the public to astronomy and the RASC. We anticipate, though, that we will need a large effort after the pandemic to reintroduce the public to in-person astronomy events and to regrow Centre membership.

Randy Dodge
Secretary

T H U N D E R B A Y

CENTRE

Centre Meetings—Meetings are held on the second Tuesday of each month. Due to COVID-19 restrictions, meeting in person was not possible, therefore meetings were held online using the Zoom platform. This year, the Centre held 9 meetings from February to June and September to December with a break for July and August.

Attendance—Meetings averaged between 10-13 people.

Membership—As of the end of December 2021, the Thunder Bay Centre had 38 members.

Centre Executive

- President—Doug Stuart
- Vice-President—vacant
- Treasurer—Brigitte Schaffer
- Secretary—Tracy Irvine
- National Council Rep.—vacant

Centre Appointed Positions:

- Newsletter Editor—Ted Bronson
- Observing Chair—Doug Stuart
- Outreach Coordinator/Facebook Administrator—Brendon Roy

Outreach

February 2021—Quetico Provincial Park

For the past few years, the Thunder Bay Centre has been working with Quetico Provincial Park towards gaining a RASC Dark-Sky designation, specifically that of Dark-Sky Preserve (DSP). Unfortunately, a number of factors have prevented our two organizations from

being able to move forward together in this endeavour. However, our involvement with the park in this regard and our education of its staff about the need for light-pollution abatement has resulted in Quetico being awarded an International Dark Sky Park designation from the International Dark-Sky Association. Although we wish this had been achieved with our organization, we are happy that Quetico Provincial Park has taken the steps needed to preserve our enjoyment of the night sky and we look forward to working with them again in the future.

September 2021—Sleeping Giant Provincial Park

The Thunder Bay Centre is invited every year to give presentations to the campers at Sleeping Giant Provincial Park over the Labour Day long weekend. With COVID-19 restrictions in place, we were limited to outdoor presentations at their amphitheatre with no public observing component scheduled. Brendon Roy attended and gave presentations to the assembled campers; attendance was approximately 60 campers on Friday, 60 on Saturday, and 30 on Sunday.

October 2021—Brownies

The Thunder Bay Centre was contacted by the local Brownies group who requested an outdoor astronomy activity that would be fun and informative for their girls. The sky was overcast but we were still able to let the Brownies use binoculars and telescopes to learn about viewing objects at a distance. We also did an interactive demonstration with each group of girls showing the relative distance between Solar System objects. At the end of the night, we handed out Moon Gazer's Guides to each of the girls and to the Brownie troop leaders. In attendance from the Centre were Brendon Roy, Tracy Irvine, and Doug Stuart.

Monthly Talks

February	Doug Stuart and Brendon Roy shared their pictures of the December 2021 "Great Conjunction" of Jupiter and Saturn Naked Eye to Deep Sky—Constellation: Ursa Minor by Brendon Roy
March	Andreas Buchholz—Landing of NASA's Mars Perseverance Rover Tracy Irvine—JAXA's AKATSUKI Orbiter of Venus Naked Eye to Deep Sky—Constellation—Aquila by Brendon Roy
April	Andreas Buchholz—Europa Tracy Irvine—NASA's Juno Orbiter at Jupiter Naked Eye to Deep Sky—Constellation—Crux by Brendon Roy
May	Tracy Irvine—JAXA's Hayabusa2 and Asteroid Ryugu Naked Eye to Deep Sky—Constellation—Indus by Brendon Roy
June	Ted Bronson—The June 10, Annular Solar Eclipse Tracy Irvine—CNSA's Tianwen-1 Chinese Mars Rover Naked Eye to Deep Sky—Constellations: Piscis Austrinus, Microscopium And Corona Australis by Brendon Roy
September	Ted Bronson: The November 11, 2019 Transit of Mercury Naked Eye to Deep Sky—Constellations: Mensa and Triangulum Australe by Brendon Roy
October	Thunder Bay Centre AGM: Position of Treasurer was open for election; Brigitte Schaffer was the

only person nominated; she accepted the nomination and was acclaimed to the position. After the AGM concluded, the regular meeting began.

Ted Bronson: My Pictures of Comet NEOWISE

Show & Tell Segment (new): This portion was added to our meetings in order to encourage discussion and engagement between our members over the Zoom platform. This had been an important component of our in-person meetings and we felt a less formal and more interactive part of the meeting would be appreciated by our members.

At this meeting, Brendon Roy showed pictures of the progress he had made on his new property, the future site of a remote observatory.

Naked Eye to Deep Sky—Constellation: Triangulum, Asterism: The Sauce Pan by Brendon Roy

November
Ted Bronson: The Upcoming Partial Lunar Eclipse Show & Tell: Ted Bronson shared the books he uses to find eclipse information
Doug Stuart: Seeing the Starlink Satellites
Naked Eye to Deep Sky—Constellation: Ophiuchus, Asterism: Smiley Face in Auriga by Brendon Roy

December
Tracy Irvine: Astronomical Catalogues
Show & Tell: November Partial Lunar Eclipse pictures from Brendon Roy, Fr. Francisco Blazek, Ted Bronson and Doug Stuart
Naked Eye to Deep Sky—Constellation: Antlia, Asterism: Num Sum by Brendon Roy

Centre Observing Sessions

The Thunder Bay Centre held 8 observing sessions in 2021.

June 24	Location: Jackpine Park Number of attendees: 4 Observed objects: Clouds
July 29	Location: Jackpine Park Number of attendees: 6 Observed objects: M10, M11, M12, M15, M27, M31, M32, M57, M110, NGC 457, NGC 884/869
August 12	Location: Swinger's Golf Course Number of attendees: 3 Observed objects: Perseid meteor shower
August 14	Location: Home of Barney DeSousa Number of attendees: 9 Observed objects: Jupiter, Saturn, M13, M15, M31, M32, M57, M110, NGC 884/869
August 26	Location: Jackpine Park Number of attendees: 3 Observed objects: Clouds
August 31	Location: Swinger's Golf Course Number of attendees: 3 Observed objects: Saturn, double shadow transit of Jupiter
September 29	Location: Jackpine Park Number of attendees: 3 Observed objects: Clouds
October 29	Location: Home of Barney DeSousa Number of attendees: 3 Observed objects: Caroline's Rose, Abell 426, Stephan's Quintet, M5, M13, M15

Special Recognition

Congratulations to Thunder Bay Centre and lifetime RASC member Ted Bronson for his recent recognition by the International Astronomical Union. Asteroid (10082) Bronson = 1990 OF2 was so named in acknowledgement of Ted's many contributions to the RASC and the furtherance of amateur astronomy in Thunder Bay. Ted was instrumental in founding the Thunder Bay Centre and over the years has served in every position on its Executive Board. In 2006, Ted was awarded the RASC Service Award. His current position is Newsletter Editor. He is an avid eclipse watcher/chaser and regularly gives presentations to members on his varied astronomical interests. Note: Asteroid (10082) Bronson = 1990 OF2 is a main-belt asteroid with an orbital period of 3.62 years.

Tracy Irvine
Secretary

TORONTO

CENTRE

Introduction

The activities of Toronto Centre proceeded through the ongoing COVID-19 pandemic by adjusting its operations to fit the situation. All meetings and events were virtual and held on-line. The only exception was the Carr Astronomical Observatory, which allowed restricted in-person visits by Centre members. Also, where operational maintenance tasks at the CAO and David Dunlap Observatory required a physical presence, these were carried out with due regard to safety protocols.

Membership Report

At the end of the 2021 fiscal year, the Toronto Centre had 753 members comprising 66 Life members, 526 regular adult members, 27 youth members and 134 family members (split between 91 adults and 43 youth). The Centre's membership numbers have made a modest gain during the year from the 726 total members in the previous fiscal year, with 152 new acquisitions and 125 members who did not renew their memberships.

In May 2021, the national membership database software was upgraded from iMIS to Driven; a significant challenge for the entire Society and its database users as errors and omissions continue to be discovered and corrected. However the new software should be more flexible and robust, and going forward it should be of significant benefit to the Society.

The Centre received \$8,121.82 in donations from its members during fiscal 2021 supported by approximately 140 unique donors. This represents approximately 25% of our Life and Regular membership who have chosen to support the Centre and its activities financially and we thank them for their generosity. \$5,937 was donated in general support of the Toronto Centre, \$1,885 directed to support the Carr Astronomical Observatory and \$300 directed to support the David Dunlap Observatory. It is noted that 95% of all donations were made during the first seven months of the fiscal year.

Two issues of the Centre's newsletter SCOPE were published during 2020 and 2021; Volume 58 in October 2020 and Volume 59 in August 2021.

In Memoriam

Toronto Centre was notified of the passing of three Members in 2021.

- Tom Bolton
- Alan Kosugi
- Kulli Milles

Volunteer Coordination Committee Report

Sadly, there was little communication with Alexandra Doak, fellow Volunteer Coordinator committee member. The pandemic has been challenging for many university students.

The Volunteer Coordinator advertised volunteer needs or "job postings" on the Centre forum and in the president's announcements during each meeting.

Thanks to Charles Yung and Alex Arjomand for resuming the astronomy-camping activities. Thanks to Don Stewart for assisting with Information Technology matters at the Carr Astronomical Observatory.

Efforts were made to get more volunteers able to help as telescope-camera operators with the increased activity surrounding virtual star parties. Thanks to Francois Van Heerden, Ian Wheelband, Rick Foster, Claudio Oriani, Andrew Reid, and Denise Chilton for their assistance during numerous events.

Thanks for the volunteer commitment to the Stellarium Training Series—Kersti Meema, Al McCue, and Ian Bain.

The on-going pandemic meant that a volunteer appreciation picnic was not held. There are many people who continue to passionately and quietly support the Toronto Centre.

Education and Public Outreach Committee Report

This report covers the period from 2020 October 1 to 2021 September 30. The Education and Public Outreach Committee (EPO) had no in-person meetings due to COVID-19 during this reporting period, but virtually met with several thousand on-line participants. Virtual events are often recorded and left up on YouTube for further views. These additional views are not included in the numbers, but often represent higher viewing totals than the event itself.

EPO raised \$1358 in this reporting period.

Toronto Centre EPO is possible only by the generous time sacrifices of our members. Volunteering members are recorded in the event descriptions below.

EPO Committee members: Ian Wheelband (chair), Tanya Oleksuk, Arnold Brody, Marc Teitelbaum, and Andrew Reid.

EPO consists of the main committee, as well as Shawn Lee's Solar Observing group (currently inactive due to COVID-19 restrictions) and the Durham Outreach subcommittee led by Arnold Brody.

New Items:

This year, the most significant news has been the continuation of the global pandemic, resulting in no face-to-face activities since mid-March 2020. The EPO committee has continued with online activities.

RASC National has undertaken a NOVA rewrite project and several Toronto members are involved in that project. It will provide a new format NOVA course that can be delivered either virtually or in person. EPO plans to present the new NOVA program once complete.

Outreach Activities

Shawn Lee's Solar observing group

The solar observing group led by Shawn Lee has been dormant due to COVID-19 restrictions.

Durham Outreach Subcommittee:

The Durham group oversees all EPO activities in the Durham Region, including NOVA Pickering and Millennium Square star parties, as well as group events. The sub-committee is led by Arnold Brody and consists of Eric Peters, Warren Gallagher, Sam Bosnick, and Dan McRae.

The Durham group has been unable to host in-person events this year and led two virtual events this reporting period.

Centre Outreach Activities completed:

1) First Light

Report provided by Kersti Meema.

First Light—New Members Orientation, Mar/April 2021

First Light is a free three-evening program that introduces new members to the activities and benefits offered by the Toronto Centre. In 2021, it was successfully held over Zoom, although new members did not get to meet other members in person which is deemed an important aspect of First Light. Sharmin Chowdhury and Kersti Meema were the organizers and hosts/speakers for the meeting. Guest speakers included: Francois van Heerden and Steve McKinney. There were 30 new members and an average of 16 attended each evening.

2) St Clair O'Connor community astronomy club.

SCOC and Toronto Centre have returned to virtual presentation of these events. Marc Teitelbaum is the lead volunteer hosting a casual monthly astronomy club meeting for the senior residents. Marc writes: After brief discussion with SCOC, Toronto Centre resumed giving astronomy talks in March. There was a nice variety of topics, all presented remotely, from March through September. The SCOC Director of Programming, Ms. Sheppard, assisted by sitting with individuals to help them connect. Starting in August, SCOC invited the audience to sit in their assembly hall. However, TC volunteer speakers were not yet comfortable resuming in-person presentations at this point, so the talks continued remotely. We thank the following TC volunteers for making this happen: Ian Wheelband, Geoff Booth, Ron MacNaughton, Kersti Meema (2 talks), Chris Vaughan, and Arnold Brody. Marc Teitelbaum arranged the speaker schedule. Each meeting is about 90 minutes long, attended by about two dozen residents, and SCOC donates a \$150 honorarium for each talk. We hosted seven lessons in the reporting period, March to September.

3) Library visits:

There were no Face-to-Face Library visits this past year.

Seven virtual library events were completed by Ian Wheelband as follows:

October 14	Ramara Public Library: Planets. 25 participants.
October 15	Blue Mountains Public Library: Light Pollution awareness and abatement workshop. 10 participants
October 20	Blue Mountains Public Library. Virtual planet and star gazing live telescope viewing event.
February 11	Blue Mountains Public Library. Winter stargazing and virtual telescope viewing.
March 18	Blue Mountains Public Library. Family astronomy and live telescope views.
April 06	Ramara Public Library. Family astronomy.

August 26 Wasaga Beach Public Library (WBPL). Family astronomy and live telescope views. WBPL also provided \$100 honourarium.

Special thanks to library staff Jo-Hellen Berner at Ramara library, Anglea Kemp of the Wasaga Beach Public Library, and Jennifer Domingues at the Blue Mountains Library for providing these outreach opportunities for the Centre.

4) Guides and Scouts Canada (virtual events).

November 11 216th East York Guides and Pathfinders. Durham EPO conducted one virtual astronomy presentation, presented by Arnold Brody and live telescope views as provided by Ian Wheelband. 29 participants, \$58 in fees collected.

February 25 1st Streetsville Scouting. Astronomy with RASC was presented to approximately 30 Scouting members, provided by Dr. Bhairavi Shankar, Dr. Ralph Chou, and Ian Wheelband. \$100 honourarium was provided.

5) Special events:

a. October 21, 2020. Virtual presentation to Canadian Wildlife Federation (CWF). This was an online presentation called "Family Astronomy" and was organized with CWF experiential education manager Kailey Setter from Calgary, Alberta. Exact counts of people were not recorded, however several hundred members of the public from across the country attended the hour-long session. Ian Wheelband hosted.

b. September 11, 2021. Dunlap Institute Planet party. This annual event is held in collaboration with the Dunlap Institute, this year called the Planet Party and held online again. Over 2000 views of the YouTube stream were made on the night of the event. Centre participation consisted of Chris Vaughan and Dr. Bhairavi Shankar providing online astronomy content and panel discussions. Live telescope views were provided by Denis Grey, Chris Vaughan, Francois van Heerden, and Ian Wheelband. Special thanks go out to Dr. Michael Reid of the Dunlap Institute, University of Toronto, for including the Centre as an annual partner in these events.

c. Ontario Science Centre (OSC) events:

October 23, 2020. Halloween Star Party with OSC. Toronto Centre supported the OSC program with live telescope views as provided by Rick Foster, Francois van Heerden, and Ian Wheelband. Chris Vaughan provided astronomy content as a speaker, Tanya Oleksuik provided Moon images and behind-the-scenes support, with Andrew Reid providing live stream support.

February 18, 2021, Virtual Star Party with OSC, supported by Centre members Blake Nancarrow, Andrew Reid, Dr. Bhairavi Shankar, Francois van Heerden, Chris Vaughan, Tanya Oleksuik, and Ian Wheelband.

These Science Centre events would not be possible without the dedicated work completed by Betty and Andrew Reid, bringing all of us together virtually through the internet. Special thanks also go to Dr. Rachel Ward-Maxwell and Jana Abed of the Ontario Science Centre for providing these outreach opportunities.

d. Clarington Winter Wonder Learn. Durham Outreach provided astronomy content and constellation finder guides in support of this annual event. Arnold Brody has been a part of this event for 18 years now. Volunteer time provided by Arnold Brody, Eric Peters, Warren Gallagher, and Sam Bosnick.

e. York Region Science Fair. April 9, 2021. Marc Teitelbaum was a remote judge representing Toronto Centre. He awarded two youth memberships and a \$50 scholarship to two high school students who prepared and showed space science related projects.

Continuing with EPO and a look ahead:

The EPO committee will continue to monitor the pandemic situation and provide updates to Council as needed for the potential return to in-person outreach. With the curtailment of “at the eyepiece” events we have continued to rely heavily on the live streaming service provided by Andrew and Betty Reid.

To move ahead in this virtual field, we continue to look for more volunteers. Please contact the EPO committee through one of our members above, or through the Centre’s email publiceducation@rascto.ca

David Dunlap Observatory (DDO) Report

The DDO Committee arranges and oversees all DDO outreach activities associated with the Toronto Centre Partnership Agreement with Richmond Hill.

Events

Between 2020 October 1 and 2021 September 30, the DDO hosted 27 online astronomy outreach events. More than 1,800 participants enjoyed astronomy outreach programming. Recurring programs offered throughout the year have included:

- Ask an Astronomer: an intimate conversation with a DDO astronomer, covering observing tips, upcoming sky-highlights, and participant questions.
- Astronomy Speakers Nights*: lecture by a guest speaker, DDO tour, views through the 74-inch telescope.
- Sunday Sungazing*: information about the Sun, safe observing, and views through member telescopes.
- Up in the Sky*: information about the night sky, the Solar System, and the wider Universe, with views through the 74-inch telescope and member telescopes.

We also offered several special events throughout the year:

- Panel discussion on fostering diversity in astronomy (October 2020)
- Mars Madness*: information about Mars at closest approach & opposition, with views through the 74-inch telescope and member telescopes* (October 2020)
- Presentation about the DDO for Hamilton Centre (February 2021)
- Out of this World Spring Break (April 2021)
- Perseids Meteor Shower (August 2021)

Note: Weather permitting, all events marked with * provided live views of target objects.

Volunteers & Staff

Between 2020 October 1 and 2021 September 30, the DDO Committee included Denise Chilton (Chair), Eric Briggs, Bhairavi Shankar, Chris Vaughan, and Ian Wheelband. The committee was supported by a part-time outreach coordinator, Celia Du, from October until December 2020. In February 2021, the committee finalized the hire of a new coordinator, Shahin Dashtkian. The committee wishes to thank Celia and Shahin for their service.

Many thanks especially to our volunteers: Ron Bonner, Eric Briggs, Ennio Cellucci, Denise Chilton, James Chilton, Paul D’Amelio, Joel Dick, Rick Foster, Mario Gagnon, John Ginder, Rhonda Gribbon, Ward LeGrow, Phil Morrow, Blake Nancarrow, Hilding Neilson, Claudio Oriani, Karthik Othayoth, Andrew Reid, Betty Reid, Emma Seabrook, Neerja Shah, Bhairavi Shankar, Francois van Heerden, Kirsten Vanstone, Chris Vaughan, Peter Visima, Ian Wheelband. We could not offer programs without your initiative and enthusiasm! Apologies to anyone we have missed!

City and Dark Sky Star Parties Report

Due to continued COVID-19 restrictions, our observing activities

(City Star Party and Dark Sky Star Party) remained suspended.

We were, however, encouraged to see members organize an outing on their own to Glen Major Forest using the Forum and their amazing reports and images captured.

And even during a pandemic, Toronto Centre members can pursue RASC Observing Certificates.

One Toronto Centre member was awarded Certificates in the past fiscal year, Ian Bain: Explore the Universe—Telescope, Explore the Moon—Telescope

Audio Visual Team Report

The AV Committee has had a very busy year. Since November 2020 we have live-streamed 32 events, including our Recreational Astronomy Night Meetings, Speaker’s Night, DDO Astronomy Night, DDO Up in the Sky, and, last but not least, a special Zoom broadcast for Richmond Hill Library presented by the DDO Committee. Plus, we handled the technical streaming of 2 programs for the Ontario Science Centre. One was a special Zoom presentation called Friday Trivia Night with Toronto Centre live telescope views; the other, in February, was a special Virtual Star Party with live telescope views by our members that drew almost 4,000 views. Of the 32 live-streams events, 2 were broadcasts that the AV Committee initiated itself by having views from live telescopes of the Saturn and Jupiter Conjunction, which garnished over 4000 views combined. Thanks to the participation of Claudio Oriani, Blake Nancarrow, Rick Foster, Ward LeGrow and Andrew Reid.

We have had viewers from around the world over the past year, including New Zealand, Great Britain, Venezuela, Chile, Central America, the United States, and the Netherlands. In Canada we have had viewers from coast to coast, from as far away as New Brunswick to Vancouver Island. Some in our audience are now regular viewers.

From the 32 live stream events, the AV Committee made over 53 separate edited uploads, yielding an extra 9,000 views. We also recorded a special video with Blake Nancarrow and Chris Vaughan discussing the details of the Saturn and Jupiter Conjunction. This got 369 views.

It has been a successful past year. We have had 56,345 views, which is 46% of the total number of views (121,626) since we started 4½ years ago. When we started live-streaming our meetings in April 2017, we had less than 10 subscribers. We now have 676 new subscribers for a total of 1,565 subscribers to date and still growing. Two of our videos have crossed over the 10,000 viewer mark this past year. These are by Dr. Sarah Symons from McMaster University, “It’s Sirius O’Clock: Astronomical Timekeeping in Ancient Egypt” (11,194 views and 264 likes) and by Blake Nancarrow, “Barn Door Tracker with Alt-Az Base” (10,619 views and 185 likes).

The AV committee would like to thank Ward LeGrow, Blake Nancarrow, Ennio Cellucci, Emma Seabrook, and Betty Reid for their valued contributions.

Carr Astronomical Observatory (CAO) Report

The CAO Committee members in 2020–2021 included Jeff Booth, Ralph Chou, Tony Horvatin, Genevieve Seabrook, Richard Sowards, Ed Treijs and Ian Wheelband. Ralph became Chair in January, and Ian stepped down from the Committee in September. Thanks to Ian for his service on this Committee and for his leadership.

Due to a lack of off-street parking during the winter, it was decided to close the CAO for the months when the access road was closed. Thanks are due David Brodie, Ian Donaldson and Stephen Medd for volunteering to conduct the monthly inspections throughout the winter.

Much of the Committee’s work was focused on preparing the house for use under a slightly relaxed pandemic protocol. Tony

Horvatin and Jeff Booth constructed a doorway at the foot of the stairs that would isolate the two levels of the house.

The upper level of the house was reopened to use by a single member or family unit in June. Lora Chow managed bookings and collected signed waiver forms and COVID attestations. Much of the cleaning of the house interior prior to reopening this spring was performed by Grace Horvatin and Rhonda Gribbon.

Ian Wheelband, Blake Nancarrow, and Chris Vaughan used the GBO and SLO telescopes to provide live and recorded images for virtual star parties during the summer for the L.E. Shore Public Library in Thornbury and the University of Toronto Planet Party in September.

The Committee looks forward to increased use of the CAO facilities in 2022 and a resumption of our observing and educational programs there.

2020–2021 Awards

- H.A. Winearls Award Paul Delaney
- Andrew Elvins Award Denise Chilton
- Bertram Topham Award Frank Dempsey
- Ray Thompson Award Charles Yung
- Charline Norgrove Award Grace Horvatin
- Paul Markov
- Ostrander-Ramsay Award Dan Falk

Acknowledgements

The following people were among the lead contributors to the material in this report. Thanks to them, and to all the members who worked on the various reports.

Adrian Aberdeen, Denise Chilton, Ralph Chou, Phil Chow, Tony Horvatin, Tom Luton, Blake Nancarrow, Andrew Reid, Marc Teitelbaum, Ian Wheelband

Ed Treijs
Secretary

VANCOUVER

CENTRE



RASC Vancouver Volunteer Ted Stroman giving his Moon lecture

Vancouver Centre is in its 90th year. Unfortunately, as a result of COVID19 and our ongoing inability to meet in-person, we were unable to celebrate this milestone with our members. Throughout 2021, we have continued with virtual meetings and lectures with hopes that in 2022 we can start returning to in-person events albeit with COVID19 protocols and vaccine passports.



RASC Vancouver volunteers at Manning Park Dark Sky Weekend The Jim Bernath Meteorite Collection display

In the summer of 2021, we took baby steps with returning to in-person meetings. In August, we held two Perseid Meteor Shower events—one in downtown Vancouver at Beaver Lake in Stanley Park, and the other at Aldergrove Regional Park in conjunction with Metro Parks' annual meteor shower observing event. Our weekly Starry Nights star parties on the Simon Fraser University Burnaby Campus have re-started in-person and we attended the first one on October 29 with RASC volunteers and telescopes.

We also attended the 3rd-annual Manning Park Dark Sky Weekend held October 15 to 17, albeit with reduced attendance, masks, and other COVID19 protocols. Twelve volunteers from RASC Vancouver attended this event with great success. We assisted with lectures, displays, activities, and a star party.

It was amazing to re-connect with old friends not seen in over a year, meet some new friends only seen online so far, and generally get re-energized with astronomy outreach.

At the start of the pandemic, we had concerns about loss of membership, but Vancouver Centre is happy to say that over the past two years, we actually gained members. In December 2019, we had 282 members, in December 2020 we had 288 members, and we ended 2021 with 294 members.

Here is a summary of our events for 2021 (both in-person and virtual):

- January Ian McLennan, Observatory and Planetarium Projects Update
- February Matthew Borghese, The Perseverance Spacecraft landing on Mars and Canada's important roles in the Mars Landers
- March Dr. Howard Trottier, The not-so-secret history of the Trottier Observatory
- April meeting and the Paul Sykes Memorial Lecture—Phil Plait (aka The Bad Astronomer), Strange New Worlds: Is Earth Special?
- May 8 International Astronomy Day and Science Rendezvous
- May Dr. Peter Clark, From Stars to Planets: What is needed to make life possible?
- June Ian Doktor, Introduction to Photometry
- July Matthew Borghese, Moon 2024
- August two in-person events for Perseid Meteor Shower

September	Leigh Cummings, Environmental Impacts of Light Pollution
October	Simon Foreman, Mapping the Universe with CHIME
October 15-17	In-person Manning Park Dark-Sky Weekend
November	Andrew Ferreira, Robotic Spaceflight
November	online astronomy course with Robert Conrad (weekly for 12 sessions)
December	Dr. Darren McKnight, Space Safety

Vancouver Centre is looking forward to 2022 with astronomy continuing in the virtual realm to start and high hopes for in-person soon.

Suzanna Nagy
Secretary

VICTORIA CENTRE

We continued to deal with the pandemic in 2021 and once again we practiced our creativity and flexibility as well as learning the Greek alphabet. The result was a productive year aided by support of existing alliances!

At the end of the year we had 248 members, down 6.4% from one year earlier. We found ways to hold virtual events, so in total we held 160 events with nearly 3900 Galileo moments.

Bruce Lane published another 12 excellent issues of Skynews this past year, helping to keep us connected when we can't meet in person. Joe Carr kept our members up to date on all the happenings with our website and Chris Purse with John McDonald exhibited their Zoom expertise so we could continue to "meet" and indeed reach out to others in our own virtual reality. And we worked with our partners, the Friends of the Dominion Astronomical Observatory, to support another 18 outreach events to the public.

Victoria Centre Events Regular events

Monthly Meetings

We had 7 monthly meetings as well as the AGM in February with a total of 363 attendees. These were held during the usual Astro Cafe times.

Jan	Matt Taylor, Hertzburg Institute—Judge Me By My Size, Do You? Tales of the littlest galaxies that could.
Mar	Allendria Brunjes, Editor, <i>SkyNews</i> —The world of <i>SkyNews</i>
May	Tom Field, Contributing Editor at <i>Sky & Telescope</i> —Spectroscopy
July	Brian Day & Gary Varney, NASA & Varney Observatory—The LCROSS and LADEE lunar missions and Amateur Selenology
Oct	Michelle Kunimoto, NASA's TESS mission—The search for new planets
Nov	Emily Levesque, University of Washington—The life of a professional astronomer
Dec	Robert Thirsk, Canadian Space Agency (retired astronaut)—Missions to Mars

Star Parties:

There were 16 Virtual Star Parties organized by the Friends of the Dominion Astronomical Observatory (FDAO). One a month was held from January to April and then again from September to December and 2 per month from May to August, with approximately 30–50 members of the public attending on Zoom or YouTube at each. The star parties had representation from the RASC at every one—either with speakers (Dan Posey, Dorothy Paul, and David Lee), Ask an Astronomer participation (e.g. Chris Purse), or select presentations (such as Marjie Welchframe). And every star party had David Lee and the RASC Electronically Assisted Astronomy group for a major section at the end of the session. Sid Sidhu, Chris Purse, and David Lee also helped to get the solar telescope and Celestron telescopes ready for streaming.

Astronomy Day:

Our International Astronomy Day was held on May 15 and was another collaboration between the RASC and the FDAO, with over 200 attendees over the course of the day!

Fairfield Fair:

While most fairs were cancelled again this year, Dorothy Paul, Sid Sidhu, and Randy Enkin set up a booth (in the rain!) at the Fairfield Community Association's Fall Fair, on September 26. They counted 120 Galileo moments.

Acquisitions/Losses

Membership:

We had 248 members at the end of the year (down 6.4% from 2020 and only down 9.2% from our peak in 2018 (277 members) when we were actually allowed to meet and observe!

Equipment:

The technical committee worked very hard this year to renew the VCO so it will be ready for use for members of all interests: visual observers, sketchers, and astrophotographers. Here are the acquisitions made this year.

- Nelson Walker donated his 8-inch f/4 Schmidt Newtonian telescope and Bruno Quenneville kindly agreed to donate an appropriate matching HEQ5 Sky-Watcher mount. The scope also comes with an excellent case. The wide field of view provided by this fast instrument may be of particular value to astrophotographers and it is currently being loaned to a member of the Astro Photography SIG.
- Argo Navis Setting Circles have been acquired for the 20-inch Obsession Dobsonian and will be helpful for quickly finding celestial objects.
- A Takahashi TOA-130S 130-mm refractor was obtained. The configuration of the TOA-130S is very flexible, allowing RASCals to easily attach DSLR cameras or eyepieces for visual use and astrosketching. A Takahashi focal length reducer was acquired from OPT that will enable the refractor to operate at both f/7.7 and f/5.4.
- Gary Sedun found an OGS 12.5-inch RC reflecting telescope in Arizona that John McDonald and Reg bought and donated to the club! Bruno lent a quality helical focuser. Dan attached the existing Off Axis Guider. The club purchased a controller to allow the OGS 12.5 RC auto-focus capability. The helical focuser is attached to the OGS 12.5 RC by using a custom adapter from Precise Parts. During the summer, a circuit board on the Paramount mount failed. David Lee enlisted the help of Jim Cliffe to isolate the problem and Garry Sedun charmed Software Bisque to surrender one of their scarce boards for a nominal cost.
- A QHY600PH, 60-megapixel full-frame monochromatic

camera and an electronic QHY filter wheel were purchased from OPT. The OPT store credit from a returned telescope was applied to the purchases of the camera and the Takahashi focal reducer. Astronomik LRGB 2-inch filters were purchased from Telescopes Canada. The monochrome camera will usually reside on the 12.5-inch OGS RC, but the Takahashi refractor has the flexibility to be quickly configured for a variety of users including visual observers. Additional adapters were acquired to ensure the camera/telescope connections were robust. Cables were upgraded to ensure that the large data volume from the new camera will be quickly transferred to the computer.

So, in summary, by the end of the year, the commissioning of the two new VCO telescopes is nearly complete; a new state of the art QHY600PH camera is installed on the OGS reflector; The Takahashi refractor can accommodate user-owned DSLR cameras as well as eyepieces for visual use. Visual observers also have access to the 20-inch Obsession and 12-inch Dobsonian telescopes. On top of it all the technical committee is preparing documentation to assist in training the VCO Members in Charge.

David Lee with the support of others put together a portable Victoria Centre Astrophotography Display for use at outreach events. It is ready for production which was delayed due to the pandemic.

Barbara Lane
Secretary

WINNIPEG CENTRE

Winnipeg Centre, like most, has been quiet for quite some time now but things are changing. The Centre Council this year has just completed new draft Bylaws to be voted on at the December monthly meeting. In support of this a Vision, and Mission and Goals statement. A policy manual to support this is also now being drafted. It is the hope of the Council to become incorporated in the New Year. By being incorporated the Council feels that it will be in a good position to apply for funding to upgrade the observatory and other ideas developed through the Strategic Plan. One other area of note is a concerted effort by the Council and the University of Manitoba to work more closely together.

This past September the Centre was able to have their Spruce Woods Star Party again with approximately 70 people participating.

Public outreach has finally begun again with events being held at Spruce Woods Provincial Park, the local Scouts and Girl Guides and at Oak Hammock Marsh. Many more are in development with a new Spring Star Party being looked at.

The last thing I want to mention is that last year we began a Telescopes for Kids that can be found on our homepage at <https://winnipeg.rasc.ca/>. The hope this year is to have as many telescopes as possible to share with those who may not be able to acquire one for themselves. We have already received an entry made by twin boys using Claymation stop-motion photography. If you would like to help with this endeavour please contact us through our webpage.

Dennis Lyons
National Council Rep

YUKON CENTRE

April Zoom Westar Lecture with Doug Johnstone: We had approximately 14 people in attendance for "Up All Night," a presentation about what it was like to be Director of a professional observatory and astronomical observing more generally.

June Sungazing Event with All Gender Yukon Society at the Observatory: Eight members of AGYS came to enjoy the presentation and sungazing.

Dawson City Solar Eclipse Event

Presentation at the Dawson Visitor Centre:
Attended by 7 people.

Solar Observation the day before the Partial Solar Eclipse: Attended 10 people.

Solar Eclipse Observation: A magical sunrise with the partial solar eclipse enjoyed by 50 people at the "Midnight Dome" overlooking Dawson City.

Watson Lake school visit to the Observatory: The sky was cloudy, preventing sungazing. The students were given a presentation about the sun.

August Yukon Star Party: The weather was terrible, but we had several people up to the Observatory for presentations and discussions about astronomy.

September: Kluane Northern Nights - Dark-Sky Festival: There was daytime hydrogen-alpha solar observation made possible by David Millar, with a crowd of approximately 100 people who looked through the telescope. The night sky was cloudy.

Presentation to Emily Tremblay School Students at the Observatory October

Stargazing Event with the All gender Society at the Observatory: 3 AGYS members enjoyed an introduction to the night sky and telescopic stargazing.

CBC Yukon interview with Christa Van Laerhoven about the aurora borealis.

In addition to the above we have continued to work with Parks Canada to help create a Dark-Sky Preserve at Kluane National Park. This project is still ongoing.

Forest Pearson
Secretary

FUNDRAISING REPORT—2021

RASC Fund Development

2021 was a second year of cancelled and postponed astronomy activities and events due to world wide factors. Internal disruptions also affected operations. All but one of RASC's full time employees left over a period of a few months. A system to handle membership fees, publication sales and donations was initiated without the level of internal IT expertise it ended up requiring. A new shipping company failed to deliver. The office had to relocate due to site development.

As a result of these changes, monetary support from members was impacted. For some months, online donations could not be made at the time of renewal and tax receipts were incorrect. For that, I apologize. The year's numerous database glitches and financial posting errors were unforeseen and, in my experience, unprecedented on such a scale.

Fortunately however, donors were patient, forgiving and generous with many \$100 and \$250 donations received. This is quite a change from 2017 giving levels when financial support began to be sought for RASC's charitable programming. As per this year's donor list, members gave \$500, \$1,000 and even higher amounts. Quite a few contribute to more than one fund. Some give monthly. We're also appreciative of an increase in gifts in-kind; contributions not of cash but donations of books, equipment and telescopes, many designated to the Dorner Telescope Museum. We are extremely grateful for the significant level of support entrusted with us.

Importantly, a culture of charitable giving has been introduced and nurtured as supporters establish thoughtful astronomy legacies. In 2019, Dr. Allan Carswell announced a \$300,000 matching gift and Rudolph Dorner shared his intention to bequeath a major amount to the Society. He also challenged others to do so and shortly afterwards, Winnipeg member William McDonald named the Society as a beneficiary in his will. One million dollars from his estate was received in 2021. Other members have informed RASC that they too have made personal arrangements to support RASC's vital mandate with future donations of stocks, life insurance and gifts in their will to advance astronomy. We greatly appreciate the commitment Society constituents demonstrate in such a meaningful way.

Despite challenges, fund development revenue continued to increase with ~\$1.34 million realized in 2021. On behalf of RASC staff and volunteers, I extend sincere thanks to everyone who helped the Society achieve this astronomical sum, allowing RASC to continue its stellar provision of publications, programs and services. Please contact me at 519-754-1803 or ldiveto@rasc.ca if I may assist you in your philanthropic support of astronomy. Thank you!

Lisa Di Veto
Fund Development Associate

DONATIONS—2021

The Royal Astronomical Society of Canada is a registered charity, BN #119126282 RR 0001

Gifts of \$100 and more are gratefully recognized. Thank you for your generous support!

RASC Donations

\$100–\$249

Jay Anderson
May Armstrong
Wayne Arnold
Denise Ballentine
Fred Benedikt
Andrew Bennett
Roy Bishop
Randall Boddam
Thomas Bonner
William Bradley
Donald Bradt
Eric Briggs

Christopher Butler
Darren Carefoot
Jonnie Chernusky
David Chisholm
Peter Clarke
Tasha Clowater
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Gay Docherty
Jim Edgar
Charles Ennis
Gordon Falconer
Joyce Feinberg
Pierre Ferland
Chris Gainor
Victor Gaizauskas
William Gamec
Philippe Girard
Gordon Grant
Marni Greenspoon
Don Hladiuk
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Garth Hutchinson
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Guy Ridgway
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Betty Robinson
David Robinson
John Ross
Shinya Sato

Donald Scarlett
Milton Schenk
Donald Smith
Robert Thacker
Nancy Tindall
Mark Vermette
Kevin Wenkoff
Ken Young

\$250–\$499

Dale Ellis
Rene Gadacz-Gould
Norman Jeffery
Renata Koziol
Damien Lemay
Alan McKeown
Verna McNichol
Gregory Osborne
Howard Trotter
Synapse Human Resources

\$500–\$999

Randy Attwood
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Barry Stephens
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\$1,000–\$4,999

Raymond Auclair
Stephen Bedingfield
Christine Clement
Mary Desrocher
Lisa Di Veto
Robyn Foret
Phil Groff
James Hinds
James Skinner

\$5,000 plus

Anonymous

Legacy Fund

\$100–\$249

Shawn Lee

250–\$499

Jonnie Chernusky

\$500–\$999

Randy Attwood

\$5,000 Plus

Estate of Robert May

\$1,000,000 Plus

Estate of William McDonald

Light-Pollution Abatement

\$100–\$249

Nada Beydoun
Andrew Bennett
Joseph De Koninck
Philip Gelsheimer
Christian Gigault
Neil Larsen
Shawn Lee
Martin Potter
Eloise Stikeman
Michael Wilson

\$250–\$499

David Turner

\$500–\$999

David Saraiva

Robotic Telescope

\$100–\$249

Rene Gadacz-Gould
Victor Gaizauskas
Leonard Larkin
Shawn Lee
Reza Ramezankhanr
Wayne Rosing

\$250–\$499

Neil Taylor

\$1,000–\$4,999

Randy Attwood
Brian Banks
James Edgar
James Hinds

\$5,000 Plus

Kevin Watson

Rudolph Dorner Telescope Museum

\$100–\$249

Shawn Lee

\$1,000–\$4,999

Randy Attwood

\$25,000 Plus

Rudolph Dorner

Ruth Northcott Education Fund

\$100–\$249

Denise Ballentine
Gary Bunclark
David Chapman
Francis Dawson
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Sandra Innanen
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Michael Webb
Alice Wehlau

\$250–\$499

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Christina Barker
Len Chester

\$1,000–\$4,999

Randy Attwood

In-Kind Donations

\$100–\$249

David Chapman
Sandra Manning

\$500–\$999

Roy Bishop
Roy Hughes

\$1,000–\$4,999

Cliff Nordal
Robert MacDonald

\$10,000–\$15,000

Umberto De Boni

Grants 2021

Up to \$10,000

BioTalent Canada
Clean Foundation
National Research Council
NSERC Science Literacy
NSERC Science Odyssey

\$10,001 to \$15,000

Canada Summer Jobs

\$50,000 to \$99,999

Healthy Communities
Foundation

\$50,000 to \$99,000

Natural Sciences & Engineering
Research Council of Canada

\$100,000 Plus

Carswell Family Foundation

2022 AWARD WINNERS

Ken Chilton Prize	Normand Amyot (Non-member) François Chevretils (Centre francophone de Montréal) Michel Duval (Centre francophone de Montréal)	Fellowship Award	Dr. Chris Gainor (Victoria)
Service Award	Robert Babb (St John's) Philip Downey (Niagara) Robert Lewis (Niagara) Ron Macnaughton (Toronto) Merlyn Melby (Saskatoon) Tenho Tuomi (Saskatoon) Barbara Wright (Saskatoon)	Chant Medal	
		The Plaskett Medal	Dr. Deborah Good (University of British Columbia)
		President's Award	Émilie Laflèche (Montréal)
		Simon Newcomb Award	Chris Vaughan (Toronto)
		Qilak Award	Jenna Hinds (Society Office)

PAST AWARD WINNERS

Below is a list of former winners of the Society Awards.

For names before 2000, please refer to "Looking Up—A History of the RASC" by Peter Broughton. www.rasc.ca/sites/default/files/LookingUp-300-text.pdf

For names after 2000, go to the RASC website www.rasc.ca/rasc-awards

CHANT MEDAL

The Chant Medal of the Society was established in 1940 in appreciation of the great work of the late Professor C.A. Chant in furthering the interests of astronomy in Canada. The medal is awarded not oftener than once a year to an amateur

astronomer resident in Canada on the basis of the value of the work carried out in astronomy and closely allied fields of original investigation.

2001 Richard Huziak (Saskatoon)

2002 Dr. Roy Bishop (Halifax)
2006 Ed Majden (Victoria)
2008 Dr. Geoff Gaherty (Toronto)
2018 Peter Broughton (Toronto)

FELLOWSHIP AWARD

Developed jointly by the Awards and Nominating Committees, and approved by the RASC Board of Directors in November 2013, the award of Fellow of the RASC (FRASC) is created to acknowledge the work of long-serving members. It recognizes those outstanding members who have made extraordinary contributions to the Society over the long term, much of which service has been rendered at the national level.

2014 Randy Attwood (Mississauga)

Dr. Roy Bishop (Halifax)
Peter Broughton (Toronto)
Dr. James Hesser (Victoria)
2015 Robert Dick (Ottawa)
Dave Lane (Halifax)
Dr. John Percy (Toronto)
Mary Lou Whitehorne (Halifax)
2016 Jay Anderson (Winnipeg)
Alan Batten (Victoria)

Doug Hube (Edmonton)
Franklin Loehde (Edmonton)
Patrick Kelly (Halifax)
2018 Peter Jedicke (London)
2020 David M.F. Chapman (Halifax)
Randall Rosenfeld (National Member)
2021 Roland Dechesne (Calgary)
James Edgar (Regina and Halifax)
Michael Watson (National Member)

KEN CHILTON PRIZE

The Chilton Prize was established in 1977 by the National Council of the Society in remembrance of Ken E. Chilton, an active member of the Hamilton Centre. The prize is awarded annually to an amateur astronomer resident in Canada in recognition of a significant piece of astronomical work carried out or published recently.

2008 Eric Briggs (Toronto)
Debra Ceravolo (Ottawa)
Peter Ceravolo (Ottawa)
Lou Cox (Ottawa)
Steve Gauthier (London)
Doug George (Ottawa)

Paul Gray (New Brunswick)
Walter MacDonald (Kingston)
Jack Newton (Victoria)
Ajai Sehgal (Ottawa)
Jennifer Tigner (Victoria)
Dave Toth (London)
2009 Brian Battersby (Prince George)
2010 Brian Battersby (Prince George)
Lise Charlebois (National Member)
Ted Dunphy (New Brunswick)
Paul Gray (New Brunswick)
Kim Hay (Kingston)
Marc Keelan-Bishop (Belleville)

Don Kelly (New Brunswick)
Rémi Lacasse (National Member)
Dave Lane (Halifax)
Damien Lemay (Québec)
Ron Macnaughton (Toronto)
Chris Weadick (New Brunswick)
Jennifer West (Winnipeg)
2012 Holly Ayles (New Brunswick)
2014 Kathryn Gray (Halifax)
Nathan Gray (Halifax)
2020 Peter Pekurar (Kitchener-Waterloo)

PLASKETT MEDAL

The Royal Astronomical Society of Canada and the Canadian Astronomical Society together present an award in recognition of the pivotal role played by John Stanley Plaskett in the establishment of astrophysical research in Canada. The award is made to the graduate from a Canadian university who is judged to have submitted the most outstanding doctoral thesis in astronomy and astrophysics in the preceding two calendar years. An award need not be made every year.

2006 Dr. Lauren A. MacArthur
(British Columbia)
2007 Dr. Frédéric Grandmont

(Université Laval)
2008 Dr. Adam Muzzin (University of Toronto)
2009 Dr. Catherine Lovekin
(Saint Mary's University)
2010 Dr. Helen Kirk (University of Victoria)
2011 Dr. Kaitlin Kratter
(University of Toronto)
2012 Dr. Pier-Emmanuel Tremblay
(Université de Montréal)
2013 Dr. Yasuhiro Hasegawa
(McMaster University)
2014 Dr. Andrew Pon
(University of Victoria)

2015 Dr. Anne Archibald (McGill University)
2016 Dr. Jonathan Gagné (Université de Montréal)
2017 Dr. Fereshteh Rajabin (Western University)
2018 Dr. Gwendolyn Eadie (Queen's University)
2019 Dr. Alexandra Tetarenko (University of Alberta)
2020 Dr. Simon Blouin (Université de Montréal)
2021 Dr. Ziggy Pleunis (McGill University)

PRESIDENT'S AWARD

Established in 2008, this award is to be given at the President's discretion, usually once a year, to a member who has made an important contribution to the Society, and to be presented by the President either at the General Assembly or during a visit by the President to the home Centre of the recipient.

2010 Sid Sidhu (Victoria);
2011 Mayer Tchelebon (Toronto)
2012 Randall Rosenfeld (National Member)
2013 Dave Lane (Halifax)
2014 Robert Dick (Ottawa)
2015 Walter MacDonald (Kingston)
2016 Terence Dickenson (Toronto)

2017 Dave Garner (Kitchener-Waterloo)
2018 Rick Huziak (Saskatoon)
2019 Michael S.F. Watson (National Member)
2020 Barry Shanko (Vancouver)
(posthumously)
2021 Renata Koziol (Society Office)

QILAK AWARD/LE PRIX QILAK

This award is jointly administered by CASCA, the FAAQ, and the RASC, instituted to acknowledge excellence in astronomy outreach and communication. One prize can be awarded annually in each of the three founding societies

2012 Colleen O'Hare (Okanagan)
2013 Robert Duff (London)
2014 Dr. Howard Trottier (Vancouver)
2015 Toronto Centre DDO Volunteers
(Toronto)
2016 Doug Cunningham (Toronto)
2017 Paul Heath (Halifax)
2018 Dr. Rob Thacker (Halifax) RASC
Mike Moghadam (Ottawa)

Daniel Brousseau (Sherbrooke)
2019 RASC—Chris Curwin (New Brunswick)
CASCA—Dr. Jan Cami (Western University)
FAAQ—Hugues Lacombe (Club d'astronomie de Charlevoix)
2020 not awarded
2021 not awarded

SERVICE AWARD

The Service Award was established in 1959 and takes the form of a bronze medal presented to members who have performed outstanding service to a Centre or to the National Society. Below is a list of recent winners of the Service Award.

2016 Andy Blanchard (Hamilton)
Gary Bennett (Hamilton)
Paul Gray (Halifax)
Hugh Pett (Okanagan)
Chris Teron (Ottawa)
2017 Eric Briggs (Toronto)
Simon Hanmer (Ottawa)
Katrina Ince-Lum (Toronto)
Michael Moghadam (Ottawa)
Charles O'Dale (Ottawa)
Dr. Brian Pihack (Niagara)
Betty Robinson (Mississauga)
Randall Rosenfeld (National Member)

Stan Sammy (Niagara)
Gerry Smerchanski (Winnipeg)
Don Town (Belleville)
2018 Colleen O'Hare (Okanagan)
Grant Rice (Okanagan)
Brian Lucas (Sunshine Coast)
Neil Sandy (Sunshine Coast)
2019 Michael Bradley (Sunshine Coast)
Joanne Burns (Belleville)
Phil Chow (Toronto)
Bruce Fryer (Sunshine Coast)
Robyn Foret (Calgary)
Mike Hanes (London)
A.W. Scott Masterton (Toronto)
Ed Mizzi (Hamilton)
Blake Nancarrow (Toronto)
Roger Nelson (Calgary)
Vance Petriew (Regina)
Linda Pulliah (National Member)

Laurie Roche (Victoria)
Rick Saunders (London)
Danny Sklazeski (Sunshine Coast)
Leslie Strike (Mississauga)
David Thompson (Sunshine Coast)
Luca Vanzella (Edmonton)
2020 Dennis Krause (Okanagan)
Steve Holmes (Kitchener-Waterloo)
2021 Diane Bell (Victoria)
Andrew Bennett (Okanagan)
Zoltan Boda (Okanagan)
Darrell Chatfield (Saskatoon)
Paul Delaney (Toronto)
Ellen Dickson (Saskatoon)
Dr. Leslie (Les) Dickson (Saskatoon)
Blair MacDonald (Halifax)
Ronald (Ron) Waldron (Saskatoon)
Ian Wheelband (Toronto)

SIMON NEWCOMB AWARD

This award was instituted in 1978 to recognize literary ability among non-professional members of the Society.

1994 Michael S.F. Watson (National Member)
1999 Terence Dickinson (Toronto)
2001 Dan Falk (Toronto)
2002 Dr. David Levy (Kingston)

2003 Alister Ling (Edmonton)
2004 Mary Lou Whitehorne (Halifax)
2006 Dr. Warren Finlay (Edmonton)
2007 Alan Dyer (National Member)
2008 Gary Seronik (Victoria)
2009 James Edgar (Regina)
2011 Jay Anderson (Winnipeg)
2012 Randall Rosenfeld (National Member)

2013 Alan Whitman (Okanagan)
2016 Martin Hellmich & Halley Davies (Halifax)
2017 Ivan Semeniuk (Toronto)
2018 Nicole Mortillaro (Toronto)
2020 John A. Read (Halifax)
2021 not awarded

HONORARY PRESIDENT OF THE RASC

Dr. Sara Seager (Canada)

HONORARY MEMBERS OF THE RASC

Dr. Oscar Álvarez-Pomares (Cuba)
Dr. William Bottke (United States)
Dr. David L. Crawford (United States)
Rev. Robert Evans (Australia)
Dra. Julieta Fierro (Mexico)

Prof. Andrew Fraknoi (United States)
Dr. Wendy Freedman (Canada-USA)
Dr. Owen Gingerich (United States)
Dr. Jean Meeus (Belgium)
Dr. Jay Pasachoff (United States)

Dr. P.J.E. (Jim) Peebles (United States)
Dr. Lisa Randall (United States)
Dr. Sara Seager (Canada)
Dr. William Sheehan (United States)
Dr. R. Brent Tully (United States)

PAST APPOINTED AND ELECTED OFFICERS OF THE RASC

Below are lists of former Honorary Presidents, Presidents, Secretaries, and Treasurers of the RASC. For names before 1990, please refer to "Looking Up—A History of the RASC" by Peter Broughton.

Honorary Presidents

1997–2001 Dr. Jack Locke
2001–2005 Dr. Roy Bishop
2005–2010 Dr. Robert Garrison
2010–2013 Dr. James Hesser
2013–2018 Dr. John Percy
2018–2022 Dr. Douglas Hube

Presidents

1998–2000 Randy Attwood
2000–2002 Dr. Robert Garrison

2002–2004 Dr. Rajiv Gupta
2004–2006 Peter Jedicke
2006–2008 Scott Young
2008–2010 Dave Lane
2010–2012 Mary Lou Whitehorne
2012–2014 Glenn Hawley
2014–2016 James Edgar
2016–2017 Craig Levine
2017–2018 Colin Haig
2018–2020 Dr. Chris Gainor
2020–2022 Robyn Foret

Secretaries

1999–2005 Kim Hay
2005–2007 Stan Runge

2007–2014 James Edgar
2014–2016 Dr. Karen Finstad
2016–2018 Charles Ennis
2018–2020 Roger Nelson
2020– Eric Briggs

Treasurers

1998–2004 Michael Watson
2004–2006 David Clark
2006–2007 Alan Whitman
2007–2012 Mayer Tchelebon
2012–2016 Denis Grey
2016–2016 Susan Yeo
2016–2017 Colin Haig
2017–2018 Anthony Gucciardo
2018– Catherine Carr

GENERAL ASSEMBLIES—2001 TO 2022

The following Centres hosted the General Assembly from 2001 to 2022:

2001 London
2002 Montréal
2003 Vancouver
2004 St. John's
2005 Okanagan
2006 Ottawa
2007 Calgary

2008 Toronto, Mississauga and Hamilton
2009 Saskatoon
2010 New Brunswick
2011 Winnipeg
2012 Edmonton
2013 Thunder Bay
2014 Victoria
2015 Halifax
2016 London

2017 Ottawa
2018 Calgary
2019 Toronto, joint with AAVSO
2020 Vancouver—remotely
2021 Hosted by National—remotely
2022 Hosted by National—remotely

OFFICERS AND COUNCILS OF THE CENTRES—2022

BELLEVILLE CENTRE

c/o Greg Lisk
11 Robert Drive
Trenton ON K8V 6P2
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greg-lisk@sympatico.ca

President	David Cotterell
Treasurer	Randy Boddam
Secretary	Joanne Burns
National Representative	Don Town

CALGARY CENTRE

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Roland.Dechesne@cnrl.com

Honorary President	Dr. Phil Langill, RAO
Past President	Roland Dechesne
President	Simon Poole
First Vice President	Bryan Lyonnais
Second Vice President	David Brown
Treasurer	Russel Dueck
Secretary	Peter Brackett
Councillors	Andrew Bennett
	Steve Donaldson
	Patricia Jeffrey
	Eric Klaszus
	Larry McNish
	Fred Ritter
	Adriana Stone
	Phil Tracey

National Council Reps	Steve Donaldson
	Eric Klaszus
	Judy Sterner

EDMONTON CENTRE

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President	Tom Owen
Past President	Geoff Robertson
Vice President	Jay Lavender
General Secretary	Sukrit Ahluwalia
Treasurer	Florin Sabac
National Representative	Alister Ling

FRASER VALLEY

President	Mark McLaughlin
Vice-President	Darrell Abrahams
Treasurer	Nichole McLaughlin
Secretary	Norm Taylor

HALIFAX CENTRE

PO Box 31011
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Honorary President:	Mary Lou Whitehorne
President:	Judy Black
First Vice-President:	Pat Kelly
Treasurer:	Gregg Dill
Secretary:	Peter Hurley
National Representative	Pat Kelly

HAMILTON CENTRE

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Honorary President	Roger Hill
Past President	Gary Bennett
President	John Devonshire
Vice-President	Bob Prociuk
Treasurer/Secretary	Abigail Hughes
National Representative	Andy Blanchard

KINGSTON CENTRE

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President	Kim Hay
Vice President	Laurie Graham
Treasurer	Susan Gagnon
Secretary	Elena Zanetti
National Council Rep	John Hurley
Honorary President	David Levy

KITCHENER-WATERLOO CENTRE

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secretary@kw.rasc.ca

President	Trevor Chandler
Vice President	Steve Holmes
2nd Vice President	Simon Cant
Treasurer	Jim Failes
Secretary	Mel Roman
National Representative	open
Former President	Rockney Jacobson

LONDON CENTRE

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info@rasclondon.ca

Honorary President	Peter Jedicke
President	Rick Saunders
Vice-President	Bill Gardner
Treasurer	David McCarter
Secretary	Norm McCall
National Representative	Mark Tovey

MISSISSAUGA CENTRE

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President	Randy Attwood
Vice President	Allan Connery
Treasurer	Anil Mathur
Secretary	Swapna Shrivastava
National Representative	Leslie Strike

CENTRE FRANCOPHONE DE MONTRÉAL

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MONTRÉAL CENTRE

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National Representative:	Chris Weadick

NIAGARA CENTRE

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PRINCE GEORGE CENTRE

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ST. JOHN'S CENTRE

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SASKATOON CENTRE

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SUDBURY CENTRE

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National Representative	vacant

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